

University of Cape Town

Faculty of Commerce

**Trading Statement Releases and the Subsequent Price
Formation Process: Evidence from the JSE**

By

Olwethu Cata

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Supervisor: Prof. Paul van Rensburg

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Abstract

The relationship between unexpected earnings and security returns subsequent to earnings announcements is widely documented in international studies (e.g., Ball and Brown, 1968; Beaver, 1968; Beaver, 1974; Foster, Olsen and Shevlin, 1984). However, much of this research has been conducted in developed stock markets, with only a handful of studies focused on the JSE (e.g., Knight, 1983; Kornik, 2005; Murie, 2014). By drawing lessons from prior international and local evidence, and for the first time on the JSE, an investigation is conducted focusing on the entire price formation process from trading statements releases to the announcements of actual earnings.

Adopting the returns based unexpected earnings measures of Foster, Olsen and Shevlin (1984) and van Rensburg's (2002) two factor APT specification to account for systemic risk, this study finds trading statements to contain new and significant information as evidenced by the presence of significant abnormal returns on their publication date. In addition, and consistent with semi-strong form market efficiency, no relationship is found between the sign and magnitude of unexpected earnings and the cumulative abnormal returns in the period subsequent to trading statement releases and preceding earnings announcement. Examining returns in the post-trading statement release period, the study found no evidence of statistically significant abnormal returns drift for good and bad news portfolios classified according to the $(-1, 0)$, $(-1, 1)$ and $(0, 1)$ unexpected earnings models and that classified according to the trading statement sign.

Consistent with prior South African studies, the publication of earnings is found to be a noteworthy market event to which investors react. In addition, the sign and magnitude of the initial response to unexpected earnings was found to exhibit a significantly positive relationship with cumulative abnormal returns over the $(2, 60)$ day period subsequent to earnings announcements, representing a stark violation of semi-strong form market efficiency. Furthermore, the negative relationship between CARs in the $(-1, 1)$ day period surrounding earnings and the post-trading statement drift postulated by Das, Kim and Patro (2007) does not appear to apply on the JSE. Examining returns in the $(2, 60)$ day post earnings announcement period, the study found evidence of predictable returns drift but that the magnitudes of the CARs were not statistically significant over this period.

Declaration

Apart from the assistance which is acknowledged and the quotations which are specifically referenced in the text and bibliography section of the thesis, this thesis is entirely my own work and not being submitted for degree purposes at any other university.

Olwethu Cata

Signed by candidate

January 2015

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All mistakes are mine.

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Chapter 1: Introduction

1.1 Context of Research

The relationship between accounting income numbers and security returns has, over the past three decades, become one of the more researched topics in accounting and finance. The growing interest in this relationship and other earnings-price anomalies is largely attributed to Fama's (1965) formulation of the Efficient Markets Hypothesis (EMH), which assumes that stock prices instantly and fully reflect all available information and that, in an efficient market, investors cannot use public information to consistently gain above-normal returns. Anomalies can broadly be defined as deviations from common order or departures from accepted theory and in standard finance theory refer to situations in which stock price movements deviate from the assumptions of the EMH (Latif, Arshad, Fatima and Farooq, 2011). In particular, the earnings-price anomaly refers to the observed predictability of future abnormal returns by using publically available information, in the form of current earnings results available in earnings reports (Ball, 1992).

The relationship between earnings results and share price movements was initially identified by Ball and Brown (1968). Their study found a positive relationship between earnings surprises and share price movements on the New York Stock Exchange (NYSE) i.e. that the share prices increased when earnings exceeded expectations and decreased when earnings were lower than expected. The robustness of these findings was confirmed when Beaver (1968) came to a similar conclusion, albeit using a different methodology. Beaver (1968) found earnings announcements to be associated with share price variation and abnormal trading volumes, which indicates that earnings announcements contain decision-useful information.

In addition, Ball and Brown (1968) also found that stock returns tend to under-react when presented with new information, but gradually correct this under-reaction as evidenced by the subsequent share returns drift in the same direction as the initial reaction for a substantial period following the earnings release. In particular, they found that share returns tend to drift upwards when earnings exceed expectations and drift downwards when returns are below expectations (Swart and Hoffman, 2013). This under-reaction of stock markets to new information has become more commonly referred to as the post earnings announcement drift (PEAD).

Since Ball and Brown's (1968) seminal paper, a significant amount of research has been conducted to test the existence of a relationship between accounting income numbers and security returns and PEAD in other markets around the world. Most of this research has, however, focused on developed stock markets and US stock markets in particular. Although the existence of a positive relationship between accounting income numbers and security returns and PEAD have been widely confirmed in US stock markets and other developed markets such as Australia, Canada, France, Germany, Hong Kong and the UK (Fu, 2014), tests on several developing countries found no evidence of PEAD (Bhattacharya Daouk, Jorgenson and Kehr, 2000; Hong, Lee and Swaminathan, 2003). These differing findings suggest that the existence of a relationship between accounting income numbers and security returns may be unique to particular stock markets or may be unique to stock markets that have reached a certain level of development.

Given South Africa's status as an emerging market and the differences between the JSE and developed markets, in terms of size and liquidity, it is unlikely that the earnings-price relationship found in developed markets can be generalized to the Johannesburg Stock Exchange (JSE). There are, however, a handful of studies that investigate the relationship between earnings announcements and share price movements on the JSE. These include Knight (1983) and Kornik (2005) who found the existence of a relationship between earnings and share returns. Other studies investigate share price overreaction (Bhana, 1995), share price reaction to dividend and management buyout announcements (Bhana, 1997, 1998, 2005) and the post earnings announcement drift (Swart and Hoffman, 2013; Murie, 2014).

While several studies have considered investor reactions to earnings announcements on the JSE, only one study, Murie (2014), has investigated investor reactions to trading statement releases. Trading statements are part of the JSE's listings requirements and must be published when a firm is satisfied to a reasonable degree of certainty that its results will deviate by 20% from their previous comparable results or the firm's guidance. Murie (2014) found that these statements contain significant information content and that share returns tend to drift in a predictable direction following their release. However, a knowledge gap remains since none of the prior studies have investigated the price formation process subsequent to trading statement releases and in the period leading up to the actual earnings announcement.

1.2 Objective of the Study

This study aims to examine the relationship between trading statements, earnings announcements and stock returns. In particular this study focuses on the incorporation of new information in the period following a trading statement release and leading up to the announcement of actual earnings. In line with Das, Kim and Patro (2007), we examine share returns in four distinct periods: the trading statement release date, the period following the trading statement release and leading up to the earnings announcement, the (-1, 1) day period surrounding the earnings announcement and the (2, 60) day period subsequent to earnings announcements. Specifically, this study aims to:

- Examine the immediate market response to good and bad news contained in trading statements
- Examine the possibility that the post trading statement announcement drift reported by Murie (2014) may in fact merely be a reflection of the trading statement release's proximity to actual earnings.
- Compare the share price reaction around the earnings release period to the reaction in the post trading statement release period
- Examine the existence of predictable returns drift in the period subsequent to trading statement releases and preceding earnings announcements and in the (2, 60) day period subsequent to earnings announcements.

1.3 Motivation for the Study

The choice for investigating the relationship between share returns and both trading and earning statements is motivated by a number of considerations. Firstly, as mentioned above, the bulk of the studies investigating the earnings-price relationship have focused on developed stock markets. Given the differences that exist between developed and emerging stock markets, it is unlikely that findings in developed stock markets can be generalized to emerging markets such as the JSE. Furthermore, emerging markets have undergone significant policy changes over the past two decades and their evolution may be driven by characteristics which are unique to individual countries and their stages of economic and financial development (Arbelaez, Urrutia and Abbas, 2001). It therefore appears important to study emerging stock markets, such as the JSE, in isolation from other stock markets if we are to uncover their idiosyncratic characteristics.

Secondly, although a handful of studies investigate the relationship between earnings and stock returns on the JSE, only one study (Murie, 2014) focuses on the relationship between trading statements and

stock returns. Furthermore, no study looks at the relationship between trading statements, earnings announcements and stock returns on the JSE. This study therefore seeks to build on the research conducted by Murray (2014) by investigating the price formation process from the time trading statements are released to the announcement of actual earnings. This should provide greater insight on the extent to which the trading statement incorporates information about the forthcoming earnings announcement and help reduce the knowledge gap on the price formation process subsequent to trading statement releases and in the period leading up to earnings announcements.

Thirdly, and lastly, interest in emerging markets has grown significantly over the past two decades, mostly due to their relatively high returns and growing importance in international portfolio diversification. Investors looking to invest in emerging markets may thus require knowledge about how these markets incorporate new information into stock prices, i.e. their efficiency. This knowledge should be of particular interest to investors looking to take advantage of arbitrage opportunities presented by the post earnings/trading statement announcement drift, who may benefit from an investigation of the profitability of an investment strategy that involves going long on “good news” firms and shorting “bad news” firms. This study should therefore enlighten investors on the possibility of making above-normal returns through a trading strategy that seeks to exploit stock return drift.

1.4 Organization of the Study

The rest of this study is structured as follows: (i) Chapter two looks at the theoretical foundation through which the earnings-price relationship can be analysed; (ii) Chapter three reviews the empirical literature on the relationship between accounting income numbers and share returns; (iii) Chapter four looks at the important idiosyncratic characteristics that distinguish the JSE from other stock markets; (iv) Chapter five sets out the hypothesis and provides a description of the methods employed in this study; (v) Chapter six describes the data collection process and the criteria for firm inclusion into the sample; (vi) Chapter seven analyses the empirical results and (vii) Chapter eight concludes and discusses areas for further research.

Chapter 2: Theoretical Framework

2.1 Introduction

This chapter provides an overview of the theoretical considerations that form the foundations on which the relationship between earnings and stock returns can be analysed. The chapter reviews the origins and different forms of the efficient markets hypothesis, discusses how modern portfolio theory solves the issue of asset allocation in efficient markets and looks at the risk-return relationship as modelled by the capital asset pricing model (CAPM).

2.2 The Efficient Markets Hypothesis

The origins of the EMH can be traced back to Bachelier (1900) who studied the random process by which stock prices are generated. Bachelier (1900) described how *“at any given instant, the market believes in neither a rise nor a fall in price”* or else *“it would quote not this price but another price higher or lower”*. This is the earliest known description of the behaviour of efficient markets and laid the foundations for subsequent research on market efficiency (Blume and Siegel, 1992). This was followed by research on the random walk hypothesis including Working's (1934) investigation of the behaviour of wheat prices, Kendall's (1953) study of US commodity and British stock prices, Osborne's (1959) theory that security prices are independent and normally distributed and Samuelson's (1965) theorem proving that price differences between periods are uncorrelated.

Fama (1965) reviewed and tested the validity of the independence assumption of the random walk hypothesis and concluded that it is consistent with reality and the existence of an efficient market. He described an efficient market as one in which the prices always represent good estimates of the intrinsic value of stocks, given available information. Fama's (1965) conclusions have significant implications regarding the value that technical and fundamental analysts can add to the investment process. Firstly, they imply that technical analysis is without value, as knowledge of past price behaviour cannot be used to consistently predict future behaviour (Fama, 1965). Secondly, they imply that, to add value, fundamental analysts have to possess better insight or new information that has not already been incorporated into prices (Fama, 1965).

In subsequent research Fama (1970) described three forms of market efficiency: (i) weak form efficiency in which prices fully reflect all historic information and in which investors cannot use historic information to earn above-normal profits, (ii) semi-strong form efficiency in which prices fully reflect all

publicly available information and in which investors cannot use publicly available information to earn above-normal profits, and (iii) strong form efficiency in which prices reflect all information, both private and public, and in which investors cannot use public or private information to earn above-normal returns.

Empirical studies have generally given sufficient evidence to accept the weak form of the EMH (Seneque, 1979). This evidence is primarily from the random walk literature which focuses its tests on historic prices as the information subset of interest. It reasons that any form of systematic predictability in price from the use of historic information would be neutralized as traders attempt to exploit such predictability (Fama, 1965). In contrast, attempts to validate the semi-strong form of the EMH are ongoing. The investigations have generally involved tests on how quickly information contained in publicly available information (such as announcements of stock splits, earnings and management forecasts) is incorporated into stock prices. Markets are considered to be more efficient the faster the stock prices adjust in the period after the news release. On the other hand, the strong form of the EMH is largely considered unproven (Seneque, 1979).

2.3 Modern Portfolio Theory

The origins of modern portfolio theory (MPT) are largely credited to Markowitz (1952, 1959) whose pioneering work "*Portfolio Selection*" was the first to use mathematical formalism in the context of portfolio diversification. Although the benefits of portfolio diversification had long been recognised (e.g. Bernoulli, 1954; Graham and Dodd, 1934; Williams, 1938), Markowitz contributed the insight that while portfolio diversification can reduce risk without changing the portfolio's expected return, it cannot eliminate risk (Rubinstein, 2002). He formulated the portfolio selection problem as a choice between the mean and variance of a portfolio's returns such that investors ought to maximize the portfolio's expected returns while minimizing its variance (Elton and Gruber, 1997).

Furthermore, Markowitz emphasized that what matters in deciding whether to include a stock as part of a portfolio is not necessarily the stock's own risk, but its contribution to the riskiness or variance of the entire portfolio (Rubinstein, 2002). In other words, the decision on whether or not to include a particular stock as part of a portfolio should be based on its covariance with all the other stocks in the portfolio as illustrated by the equation:

$$\sigma_p^2 = \sum_j x_j^2 \sigma_j^2 + \sum_j \sum_{k \neq j} x_j x_k \rho_{jk} \sigma_j \sigma_k$$

Where σ_p^2 is the portfolio's return variance, σ_j^2 is the variance of security $j = 1, 2, 3, \dots, m$, x_j^2 is the proportion of the portfolio held in security j , ρ_{jk} is the correlation between securities j and k and $\rho_{jk} \sigma_j \sigma_k$ is the covariance of the returns of securities j and k .

Tobin (1958) expanded Markowitz's (1952) analysis by introducing a riskless security that could be borrowed or lent at the risk free rate of interest. Tobin's separation theorem proved that, in a world with a single riskless asset, the portfolio selection problem faced by risk-averse investors is choosing between the riskless asset and the same portfolio of risky securities (Buiter, 2003). The differences in investor attitudes toward risk only impact the proportion of the total portfolio held in the riskless security and the common risky portfolio. Tobin (1958) also illustrated that the optimal portfolio of risky assets is the market portfolio whose desirability stems from the fact that it is completely diversified.

In a world with one riskless security, the relationship between risk and expected return on an efficient portfolio is therefore specified by the capital market line as follows:

$$E(R_p) = R_f + \sigma_p^2 \times \left(\frac{E(R_m) - R_f}{\sigma_m^2} \right)$$

The capital market line describes the relationship between the expected return of a particular portfolio ($E(R_p)$) as a linear function of the return on the riskless security (R_f) plus a market risk premium ($E(R_m) - R_f$), proportional to diversifiable (σ_p^2) and non-diversifiable (σ_m^2) risk (Hodnett and Hsieh, 2012).

2.4 Capital Asset Pricing Model

As is evident from the discussion above, modern portfolio theory is a normative theory that describes how investors ought to behave in constructing portfolios in an efficient market (Fabozzi *et al.*, 2002). Sharpe (1964), Lintner (1965) and Mossin (1966) extended Markowitz (1952, 1959) and Tobin's (1958) mean-variance analysis to determine the equilibrium relationship between the risk and return of assets based on the behaviour hypothesized by modern portfolio theory. The CAPM is premised on the idea that a security's idiosyncratic risk can be diversified away, which means that expected asset returns

should only be a function of the non-diversifiable risk or the covariance of the security's return with the return on the market portfolio. The CAPM is specified as follows:

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f]$$

Where:

$$\beta_i = \frac{\sigma_i r_{im}}{\sigma_m} = \frac{cov(R_i, R_m)}{\sigma_m^2}$$

The above equation, also known as the security market line, holds that a security or portfolio's expected return ($E(R_i)$) is equal to the return on the riskless security (R_f) plus the market risk premium ($E(R_m) - R_f$) as proportion of the security's non-diversifiable risk (β_i).

2.5 Conclusion

This section has provided an overview of the theoretical considerations according to which the relationship between trading statements/earnings announcements can be analysed. The discussion started by describing the observation from the random walk literature that security prices are generated by random process and Fama's (1965) contention that prices in efficient markets always represent good estimates of the intrinsic value of securities, given available information. We then turned to Markowitz (1952, 1959) and Tobin (1958) who furthered the analysis by solving the issue of asset allocation in efficient markets through their contribution to modern portfolio theory, a normative theory that describes how investors ought to behave in their asset allocation decision. We concluded the discussion with a look at the CAPM which formalized the equilibrium relationship between a security's risk and return that exists when investors behave in the manner hypothesized by modern portfolio theory.

Chapter 3: Literature Review

3.1 Introduction

This chapter outlines the pertinent issues in the debate concerning the use of financial statements as a source of information for investors as well as provide a review of past empirical studies investigating the decision usefulness of accounting information. The aim is to provide some context on the importance of financial disclosures as a source of information and to highlight some of the important past empirical research that has been conducted on the relationship between earning and security returns. It is also important to note that since no previous studies examine the extent to which JSE trading statements incorporate information contained in the forthcoming earnings announcement, this study shall draw on international literature investigating the decision-usefulness of management forecasts.

3.2 Earnings as a measure of financial performance and firm value

Investors require a broad range of information in order to value a particular firm and to compare the firm's value to other firms. Although investors use information from a variety of types of sources, financial statements are generally the more important and commonly used source as is evidenced by the media hype in the period surrounding their release. Financial statements provide investors information on a firm's financial position, performance and direction, which are important inputs in assessing a firm's prospects and value. In particular, earnings are the more widely used metric in valuation despite valuation theory defining firm value as the present value of the firm's future cash flows. This is attributed to the observation that earnings are a better predictor of future cash flows and thus exhibit a stronger correlation with firm value than current cash flows (Dechow, 1994).

The above mentioned link between current earnings and future cash flows is due to the accrual accounting basis and the principles on which it is rooted. Earnings are recorded in accordance with the revenue recognition and matching principles as stipulated by the International Financial Reporting Standards (IFRS). These principles require that revenue be recorded on the date on which it is earned and for expenses to be recorded on the date on which they are incurred. The accrual basis, however, does not apply to the cash flow statement which records cash inflows on the date of receipt and cash payments on disbursement. These accounting rules create a lag between earnings and cash flows which results in a stronger correlation between earnings and stock returns than actual cash flows over short time horizon (Dechow, 1994).

3.3 Events study methodology

Company information is an important input in the investment decision process, with corporate events often being the information subset of interest to investors. This is due to the fact that information on certain corporate events, such as a merger or a patent award, may alter the path of firm performance. Event studies in finance are therefore concerned with the impact of a certain identifiable event on the value of a firm. According to Mackinlay (1997), the usefulness of event studies stems from the effects of events being reflected in security prices which means that the impact can be measured within short periods after the actual event. Although financial event studies can be traced back to Dolley (1933), contemporary event study methodology first appeared in seminal studies by Ball and Brown (1968) and Fama, Fisher, Jensen, and Roll (1969).

The first step in a typical event study is to identify the exact event and the time in which it occurred so as to identify the period or the event window in which it is likely to have impacted security prices. The event in this study and in the studies reviewed is the date on which earnings, trading statements or management forecasts are announced. The period in which the event is likely to have impacted security prices is at least the date of the particular event, but usually includes a number of days surrounding the event (Mackinlay, 1997). Once the event has been identified, the criteria for selecting the firms to be studied must be established and abnormal security returns calculated through the relevant returns model. The event studies reviewed below mainly focus on abnormal return and trading volumes variation during the event window and tests the speed with which new information is incorporated into security prices.

3.4 The efficient markets assumption and earnings studies

The efficient markets assumption, which holds that in a competitive market place the effects of new information will on average be instantaneously reflected in security prices (Fama, 1965), constitutes the criterion against which the information content of earnings announcement is assessed. Motivated by a desire to provide empirical evidence on the decision-usefulness of accounting information Ball and Brown (1968) provided the link between accounting information and capital markets theories. They appealed to the efficient markets assumption as justification for using observed changes in security prices as an operational test of the decision-usefulness of accounting income numbers. Accordingly, observed revisions of security prices during the earnings announcement period are indicative of the

usefulness of accounting information (Ball and Brown, 1968). The CAPM also played an important role by facilitating the isolation of a firm's idiosyncratic return from the market component (Kothari, 2001).

3.5 Seminal studies on earnings and security returns/trading volumes

3.5.1 Ball and Brown (1968)

Ball and Brown (1968) were the first to empirically investigate the relationship between accounting income numbers and security returns. Using event study methodology on earnings data of 261 firms listed on the New York Stock Exchange, Ball and Brown (1968) provided compelling evidence that earnings announcements contain new information. Market efficiency was a central component of the study and constituted the criterion according to which the tests for information content in earnings were conducted.

Ball and Brown (1968) used two expected earnings models, the naive and regression models. The naive model assumed earnings to be the same as in the previous year, implying that any change in earnings is unexpected. The regression model on the other hand was premised on the idea that a firm's earnings are related to the earnings of other firms and general economic or market conditions. Expected earnings were thus modelled using the CAPM, where beta represents the covariance of a firm's earnings with market earnings. Firms were then segregated into "good" news and "bad" news portfolios, where earnings above expectations were classified as "good" news and earnings below expectations were classified as "bad" news. Returns for each firm in each of the portfolios are modelled using the CAPM and abnormal returns isolated by subtracting market return from each firm's realized returns. Abnormal returns for the good news and bad news portfolios are cumulated using the Abnormal Performance Index (API). The API measures the value of an investment over a chosen period after adjusting for market effects and is calculated as follows:

$$API_M = \frac{1}{N} \sum_n^N \prod_m^M (1 + v_{nm})$$

Where:

- N is the number of securities;
- M is the end of the period (in months) over which the security is held
- v_{nm} is the residual return of each security n in month m .

The study found a positive (negative) relationship between good (bad) news earnings and abnormal security returns over the twelve months preceding the earnings announcement, with 85% to 90% of the share price movement occurring in this period. This suggests that investors use more timely sources of information to inform their investment decisions. Furthermore, the earnings announcement date was found to exhibit abnormal returns and that earnings numbers capture over half of new firm specific information which becomes available during a particular year. In addition, share returns were found to continue to drift in the same direction for about two months after the earnings announcement.

3.5.2 Beaver (1968)

Beaver (1968) studied the relationship between earnings and share price and volume movements in the period surrounding the earnings announcement. The study makes a distinction between the earnings-price and earnings-volume relationships, which depends on the amount of time that lapses until consensus is reached on the expected influence of the earnings release on price. According to Beaver (1968, pp. 69-70), volumes increase when time lapses prior to consensus, while immediate consensus leads to price changes without changes in volume. In other words, volume changes are due to changes in individual investor expectations, while price changes are due to changes in market expectations.

The need to model expected returns was circumvented through examining share return variance (SRV) and trade volume activity (TVA) in the period surrounding earnings announcements. Using a sample comprising 143 firms during the period 1961-1965, share return variance was expressed as:

$$SRV_{i,t} = \frac{u_{i,t}^2}{\sigma^2(u_{i,t})}$$

Where:

$u_{i,t}^2$ is the abnormal return on share i in time t ;
 $\sigma^2(u_{i,t})$ is the abnormal return variance during non-reporting period.

The study found a significantly larger variation in share returns during the earnings announcement week than the non-announcement weeks and provided evidence that earnings reports contain new information. The study also found that, although the highest share return variation occurs in the announcement week, the second largest variation occurs in the week prior to the announcement. Beaver (1968, pp.81) suggests that this may be due to information leakages or that the Wall Street

Journal, which is the source from which the dates were obtained, was not the first to report on the announcements. Furthermore, abnormal share return variation continues for two weeks after the announcement.

Beaver (1968) also examined the trading volume activity as part of his assessment of whether earnings announcements contain new information. The trading volume activity is expressed by the formula:

$$TVA_{i,t} = \frac{\text{Number of firm } i \text{ shares traded at time } t}{\text{Number of firm } i \text{ shares outstanding at time } t}$$

With regards to trading volumes, the study found evidence of a significant increase in volumes during the week in which earnings are announced. This showed that earnings contain new information and that investors adjust their portfolios in the period surrounding earnings announcements. Furthermore, the abnormal trading activity continues for 4 weeks after the announcement.

3.6 Subsequent earnings studies

Following Ball and Brown (1968), several new areas of research into the relationship between accounting information and share price movements emerged. This section reviews the earlier studies falling under these various areas of research.

3.6.1 The information content of the magnitude of unexpected earnings

As alluded to in the discussion above, Ball and Brown (1968) were primarily focused on whether there is an association between earnings announcements and share returns. Beaver (1974) extended Ball and Brown's (1968) analysis by examining the impact of the magnitude of earnings surprises on share returns. Utilizing the same methodology as Ball and Brown (1968), Beaver (1974) found that the portfolios with the greatest earnings surprise exhibited the most variation in abnormal share returns. Beaver *et al.* (1979) confirmed these results, albeit through a slightly different methodology. They divide the share returns of the firms under investigation into 25 portfolios based on the magnitude of the earnings surprise and find a significantly positive relationship between the magnitude of earnings surprises and share return variation. In particular, Beaver *et al.* (1979) found that portfolios with large positive (negative) earnings surprises exhibited higher (lower) return variation.

3.6.2 The relationship between management earning forecasts and share price returns

Management earnings forecasts are voluntary disclosures which provide guidance to investors prior to earnings releases. There is a significant body of research on management incentives for publishing earnings forecasts and the decision usefulness of such publications. With regards to the incentives for publishing management earnings forecasts, the research generally supports the view that forecasts are not aimed at upwardly influencing stock prices in the short-run, but are an attempt to align investor expectations with those of management (Coller and Yohn, 1998). Management forecasts are also said to increase firm value by decreasing information asymmetries in the market for a firm's stock. The remainder of this section looks at the early empirical research investigating the information content or decision-usefulness of such forecasts.

Foster (1973) was the first to investigate the decision usefulness of management earnings forecasts and used the same methodology as Beaver (1968). He examined a sample of 68 management earnings forecasts published after the financial year-end by NYSE firms during the period 1968-1970. The study found a significant increase in trading volumes during the forecast publication period compared to the period surrounding the announcement, implying that investor make use of this timely source of information in their investment decision making. The study however found the new information contained in management forecast to be rapidly incorporated into security prices and that a trading strategy based on such forecasts did not yield above-normal profits. These findings were confirmed by Patell (1976), who also used the methodology of Beaver (1968) and found that management earnings forecasts are accompanied by significant share price variation.

Nichols and Tsay (1979) extended the inquiry conducted in earlier studies by investigating the information content of long-range management earnings forecasts issued by NYSE firms in the period 1968-1973. Their study was premised on the idea that short-range (such as forecasts of earnings in interim reports) and long-range (such as forecasts of earnings for the following financial year) forecasts may contain different degrees of information content and may differ in reliability. Nichols and Tsay (1979) found that firms which issue long-range management forecast exhibit abnormal price reaction in the forecast announcement week. Furthermore, the study also found a positive (negative) relationship between good (bad) news earnings forecasts and abnormal security returns over the eight weeks preceding the earnings forecast announcement.

3.6.3 Das, Kim and Patro (2007)

In a more recent study, Das *et al.* (2007) examined the price formation process over the forecast horizon using a sample of 8 386 quarterly earnings management forecasts from NYSE, AMEX and NASDAQ listed companies over the period 1995-2004. They focused on 3 periods: (i) the (-1, 1) day period immediately surrounding forecast releases, (ii) the period subsequent to the forecasts and preceding the actual earnings releases and (iii) the (-1, 1) day period immediately surrounding actual earnings releases. In particular, the study examined whether there are any asymmetries in responses to earnings forecasts and whether such asymmetries can predict price movements in the period subsequent to the forecast and preceding the earnings release. They also examine whether price changes in the period subsequent to earnings forecasts incorporate information contained in the earnings report.

Similar to previous literature, Das *et al.* (2007) found a positive relationship between abnormal returns and the information contained in the forecast over the (-1, 1) day period surrounding the announcement period. They also found an asymmetry in the market's reaction to forecast announcements i.e. the reaction to bad news forecasts was found to be larger than the reaction to good news forecasts. In addition, Das *et al.* (2007) measure whether the level of disagreement between management and analyst consensus forecasts, classified as conservative (optimistic) when less (greater) than \$0.01, have an influence on the initial reaction to forecast announcements. They found a strong relationship between the level of disagreements and cumulative abnormal returns in the period surrounding the management forecast announcement date. In particular, they found a sharp downward reaction to conservative forecasts in the period surrounding the release, but that this was followed by an upward correction in the subsequent period. Optimistic forecasts were associated with a small upward immediate reaction, but that this under-reaction was followed by an upward drift in the price during the subsequent period.

In their examination of the price formation process around the actual earnings announcement period, Das *et al.* (2007) found the reaction around this period to be negatively related to the drift observed subsequent to the forecast announcement. This was interpreted as evidence that the greater the amount of information incorporated into prices in the post forecast period, the smaller the expected reaction when earnings are released (and when the uncertainty about the accuracy of management forecasts is resolved). Furthermore, the study found the profitability of a trading strategy that seeks to exploit these patterns to be economically significant.

3.7 Evidence from International Stock Markets

Most of the early studies, and those reviewed thus far, on the earnings-price relationship have been conducted on US equity markets. However, significant differences across exchanges (such as liquidity, regulation and the number of market participants) suggest that the results observed in US markets may not be directly applicable in other markets. This section provides a brief look at evidence of the earning-price relationship in other international exchanges.

Israel

Lev and Yahalomi (1972) examined the information content of earnings announcement by 62 firms, listed on the Tel-Aviv Stock Exchange, during 1968. The study used Beaver's (1968) techniques and focused on the effects of earnings announcement on volumes traded. In contrast to prior studies, Lev and Yahalomi (1972) found evidence of higher trading volumes in weeks -10, -3, +3 and +4 than in week 0 (the earnings announcement week). The authors suggest that the increased volumes in weeks -2 and -1 may reflect information leakages prior to earnings announcements and that the gradually decreasing volumes in the period subsequent to the announcements may be due to delayed reaction from some investors.

Japan

Conroy, Harris and Park (1998) investigated the relationship between earnings, management forecasts and share prices for firms listed on the Tokyo Stock Exchange during the period 1985-1993. They focused on how earnings and management forecast surprises are priced into the market. Earnings surprises were classified as "good" news if the earnings are more than 10% greater than analyst forecasts, as "bad" news if earnings are more than 10% below analyst forecasts and as "no news" if earnings are between these thresholds. The authors found the reaction to management forecast surprises to be more pronounced than the reaction to earnings surprises and suggest that market participants view management's forecasts of future earnings as more important than historical earnings. They also found significant price reaction to earnings on day 0 (the announcement date) and that the reaction continues in the two weeks subsequent to the announcement. Interestingly, they found no evidence of price reaction to earnings before day 0, suggesting that this may be due to no information leakages prior to the announcement. Similar results were found for management forecast surprises.

New Zealand

Emanuel (1984) examined the effect of earnings announcements on security prices on the New Zealand equity market. Using a sample of 1 196 announcements during the period 1967-1979, Emanuel (1984) ranked the observations into 6 portfolios based on the size and sign of the surprise. Consistent with prior literature, the study found earnings surprises to be positively associated with abnormal returns. These findings were confirmed by Truong (2012) who investigated changes in the usefulness of earnings announcements in New Zealand. Using a sample of 2500 semi-annual announcements from 1994-2009, Truong (2012) further found that responses to earnings announcements, as measured by return and volume variation, on the New Zealand equity market increased over the sample period.

Nigeria

Afego (2013) investigated the information content of earnings announcements using a sample of 44 annual announcements released between 2005 and 2008 by 16 firms listed on the Nigerian Stock Exchange. Using Ball and Brown's (1968) methodology, the study found abnormal returns to be significantly different from zero on the announcement date. Abnormal returns were also found to be significantly different from zero in the 20 day period before and after the announcement. Furthermore, Afego (2013) found that most of the price adjustment occurred in the period before earnings are released and that the actual announcement date was "uneventful" relative to this period. The author concluded that earnings announcements do contain decision useful information and suggested that the drift in security prices 20 days after the announcement may be a reflection of the Market's slowness in adjustment to new information.

United Kingdom

Firth (1981) examined the information content of preliminary, interim and annual earnings announcement by 120 firms listed on the London Stock Exchange. Using Beaver's (1968) techniques, Firth (1981) focuses on the share price and share-dealing activity's response to earnings announcements. Share-dealing activity is measured as a ratio of the number of shares traded in the announcement week divided by the average weekly number of shares traded. The study found the preliminary report and the annual results to contain decision useful information and that the preliminary results contain the most information. Furthermore, the annual general meeting was found to not contain any new information.

3.8 Evidence from the Johannesburg Stock Exchange

3.8.1 Knight (1983)

Knight (1983) was the first to examine investor reaction to interim, preliminary and annual earnings announcements on the JSE. Using a sample of 261 earnings announcements released between 1973 and 1980 by 41 firms, the study used Ball and Brown's (1968) techniques to examine the effect of earnings surprises on share returns in the period surrounding the announcements. Expected earnings were estimated using the naive and regression models and earnings surprises segregated into good news and bad news portfolios while abnormal returns for each firm were cumulated using the API metric. Knight (1983) also uses Beaver's (1968) absolute residual analysis to examine share return variation in the period surrounding earnings announcements.

Knight (1983) found interim, preliminary and annual earnings reports to contain new information as evidenced by a significantly positive share price reaction to both good and bad news portfolios during the announcement week. However, in contrast to Ball and Brown (1968), Knight (1983) found an asymmetry in the responses to good and bad news portfolios, with "good" news having the larger reaction. Share returns for good news (bad news) portfolios were also found to exhibit non-random drift in the nine (six) weeks following the announcement. In addition, the announcement of the preliminary report was found to be accompanied by the highest residual variation, followed by the interim and annual reports. The author concludes that the preliminary report is the most informative of the three reports.

3.8.2 Kornik (2005)

Kornik (2005) examined the relationship between annual earnings and share returns on the JSE using a sample of 270 annual earnings announcements by 51 firms. The study uses Ball and Brown's (1968) naive model and an analyst forecast model to estimate expected earnings. Under the analyst forecast model, analyst forecasts of earnings per share (EPS) were considered to be the expected earnings and were compared to actual earnings to yield the unexpected earnings. Firms with earnings above expectations were segregated into a good news portfolio and those with earnings below expectations into a bad news portfolio. Unexpected earnings were further ranked into quartiles based on their magnitudes using the following formula from Foster *et al.* (1984):

$$U(EPS_{it}) = \frac{EPS_{it} - E(EPS_{it})}{|EPS_{it}|}$$

Abnormal share returns are calculated as $ar_{it} = r_{it} - r_{mt}$ and are not adjusted for systemic risk, i.e. beta assumed to be equal to one. Abnormal share returns were cumulated using the holding period return (HPR) approach, where HPR is calculated for each share as $HPR_{iw} = \prod_{t=1}^w (1 + r_{it})$ and for the market proxy as $HPR_{mw} = \prod_{t=1}^w (1 + r_{mt})$ over a period of w days. Abnormal portfolio returns were then calculated using the following formula from Barber and Lyon (1997):

$$AHPR_w = \frac{1}{n} \sum_{i=1}^n (HPR_{iw} - HPR_{mw})$$

Kornik (2005) found abnormal share returns to be positively associated with the sign of the unexpected earnings and found analyst earnings forecasts to be better expectations of earnings than the naive model of expectations. The reaction to earnings announcements was found to be asymmetric, with good news firms exhibiting a larger reaction than bad news firms do. Interestingly, a significant amount of share reaction was found to occur 2 days before the announcement. Kornik (2005) suggests that this may be due to information leakages prior to the announcement or may be due to legitimate anticipation of earnings. Furthermore, abnormal share returns were found to exhibit non-random drift in the 30 day period following the announcements.

3.8.3 Murie (2014)

Murie (2014) was the first to examine the information content of trading statement releases on the JSE. Using a sample of 58 trading statement releases, the study used the methodologies of Foster et al. (1984), Kornik (2005) and Beaver (1968) to estimate unexpected earnings, expected returns and share return variance and trading volume activity, respectively. Murie (2014) adopts the following short-term and medium-term returns based models of unexpected models used by Foster et al. (1984):

$$FE_i^{ST} = \frac{(\sum_{t=-2}^1 \tilde{u}_{it})/4}{\sigma(\tilde{u}_{it})}$$

$$FE_i^{MT} = \frac{(\sum_{t=-60}^{-5} \tilde{u}_{it})/56}{\sigma(\tilde{u}_{it})}$$

Where FE_i is the forecast error, $\sum \tilde{u}_{i,t}$ are the cumulative abnormal returns over the short and medium-run event windows $[-2, 1]$, $[-60, -5]$, respectively, and $\sigma(\tilde{u}_{i,t})$ is the standard deviation of the cumulated abnormal return over the 60 trading day periods preceding the events.

Similar to Kornik (2005), abnormal returns are calculated as $ar_{it} = r_{it} - r_{mt}$ and the returns are not adjusted for systemic risk. Furthermore, the Van Rensburg (2002) two factor specification was used in calculating market returns instead of the All Share index. However, and in contrast to Kornik (2005) who used the BHARs measure, the following cumulative abnormal returns (CAR) measure was used to cumulate returns:

$$CAR_{it} = \frac{1}{N} \sum_{i=1}^N \sum_{t=1}^W AR_{it}$$

Where AR_{it} is the abnormal return for firm i at time t , N is the number of sample firms in the portfolio and W is the length of the time period over which the abnormal returns are being aggregated. Murie (2014) pointed to the short event windows examined in his study as the main justification for using the CARs instead of BHARs, which account for the effects of compounding. According to this reasoning, the short event windows imply that the effects of compounding are negligible.

In addition, the study used the methodology of Beaver (1968) to measure the share return variation (SRV) and trading volume activity (TVA) in the period surrounding trading statement announcements. The SRV and TVA are calculated according to the formula:

$$SRV_{it} = \frac{u_{it}^2}{\sigma^2(u_{it})}$$

$$TVA_{it} = \frac{\text{The number of shares of firm } i \text{ traded in period } t}{\text{The number of shares of firm } i \text{ outstanding in period } t}$$

Murie (2014) found the sign of good news trading statements to be significantly associated with the CARs in the (-60; 1) and (3; 60) periods, but found no such association for bad news trading statements. In addition, no association was found between the sign of trading statements and CARs in the (-3; 3) period surrounding the releases, but found predictable return drift in the (-2; 1) and (0; 1) periods. Furthermore, the sign and magnitude of unexpected earnings were found to be significantly associated with the sign and magnitude of the CARs.

Bad news trading statements were found to be accompanied by substantial variation in share prices in the period preceding the releases. The author however notes that SRV is observed to fluctuate substantially over the event periods. Good news trading statements on the other hand were found to

fluctuate substantially over the announcement week, which Murie (2014) interpreted as evidence of investor reaction to the trading statement information. Furthermore, trading volume activity was found to be muted in the period preceding the release for both good and bad news portfolios, but increases substantially at the time of the release for good news portfolios. The increase in TVA occurs 2 weeks after the announcement in the case of bad news.

3.9 Conclusion

This chapter has focused on the pertinent issues regarding the use of financial statements as a source of information for investors and has reviewed prior empirical studies on the decision usefulness of accounting income numbers. The discussion began by considering the importance of financial information as a source of company information and noted that financial statements provide investors with information on the firm's performance, financial position and direction and that the importance of earnings numbers, in particular, stems from their use in company valuation. The chapter also discussed the importance of the EMH and its use as the criterion against which the information content of earnings announcements is assessed. The review of prior literature highlighted some of the important research that has been conducted on the earnings-price relationship.

Chapter 4: Background to the Johannesburg Stock Exchange

4.1 Introduction

This thesis seeks to analyse the incorporation of new information into security prices on the JSE, a topic that has received significant coverage in developed stock markets. However, and as mentioned above, there are significant differences between developed and emerging stock markets that make it unlikely that results found in developed stock markets can be generalized to emerging markets such as the JSE. The aim in this chapter is to discuss the important idiosyncratic characteristics that distinguish the JSE from other stock markets. This chapter will therefore provide a background to the JSE, an overview of the exchange's size, liquidity and segmentation and a discussion of the JSE's disclosure requirements.

4.2 Background to the JSE

The JSE was formed in 1887 following the discovery of gold in the Witwatersrand in 1886, which led to an increase in the formation of new mining and financial companies. The increase in new companies meant a need for a central market place which could provide access to capital (SAHO, 2014). Although the Securities Services Act of 2004 does not prohibit the establishment of other exchanges, none has been opened since the closure of the Union Exchange in 1958. Boosted by a rapid growth in the mining industry and an increasing number of listed companies from the industrial sector, the JSE experienced rapid growth in the 1900's and has continued on a sustained growth path reaching a market capitalization of 9.87 trillion as at year-end 2013 (WFE, 2014).

South Africa's democratic transition in 1994 brought substantial changes to the legislation governing the functioning of stock markets, culminating in a process of deregulation commonly referred to as the "Big bang" of 1995. The deregulation changed the requirements for membership of the exchange, which had previously been limited to natural person of South African citizenship, to allow all persons, including juristic persons. The JSE also moved from a single capacity trading system to a dual capacity trading system, which allowed brokers to trade securities on behalf of clients as well as hold shares for their own dealing. This enabled a movement away from fixed brokerage fees to negotiated brokerage fees, resulting in lower transactions costs (Mkhize and Msweli-Mbanga, 2006).

The "Big bang" was accompanied by other changes including the reduction of exchange controls and the alignment of domestic tax legislation with international norms. Furthermore, in 1996 the JSE moved from an open outcry trading system to an order-driven centralized electronic trading system and

introduced the Securities Exchange News Service (SENS) in 1997 to facilitate timely and wide dissemination of price sensitive information. These are said to have improved transparency and facilitated an increase in trading volumes (Mkhize and Msweli-Mbanga, 2006).

4.3 Size and liquidity

In 2013 the JSE, a member of the World Federation of exchanges (WFE) since 1963, was the 19th largest stock exchange in the world by market capitalization and ranked 22nd in terms of number of trades. The JSE has low levels of liquidity when compared to its developed counterparts with a turnover of 40% its market capitalization in 2013, compared to a 91% average for exchanges in the Americas and a 108% average for Asia-Pacific exchanges (WFE, 2014). Although small relative to other international exchanges, the JSE is the largest and most liquid stock market in Africa and continues to attract significant capital from international investors looking to benefit from international diversification.

4.4 Segmentation on the JSE

The issue of market segmentation has been a focal point in studies evaluating market proxies for CAPM application on the JSE. Van Rensburg and Slaney (1997) addressed this issue by using factor analysis to find the common sources of returns variation on the JSE. The authors found that the JSE Actuarial All Gold Index and the JSE Industrial Index are the best explainers of returns variation on the JSE and that the majority of JSE shares are seldom influenced by both factors to an equal degree. Van Rensburg and Slaney (1997) also found the two factors to be associated with different risk premiums, with the industrial sector associated with a higher risk premium than that associated with the gold sector.

In light of the reclassification of the sector indices on the JSE, van Rensburg (2002) updated the analysis conducted in van Rensburg and Slaney (1997). The author found that the aforementioned dichotomy had persisted despite the reclassification of the sector indices and that the new Financial-Industrial and Resources indices best capture the returns generating process on the JSE. Van Rensburg (2002) also examined the implications of the mining-industrial dichotomy on beta estimation and found that the dichotomy implies omitted variable bias and biased t-statistics in the conventional market model and provides a corrective procedure. Furthermore, the All Share Index was found to be mean-variance inefficient when the possibility of international investments is introduced, highlighting the superiority of the two factor APT model over the CAPM on the JSE.

4.5 Disclosure requirements on the JSE

The disclosure requirements for JSE listed firms are set out in the general obligation of disclosure section of the exchange's listings requirements. This section looks at the disclosure requirements that constitute the events studied in this thesis.

4.5.1 Periodic financial disclosures

The JSE requires that firms publish an interim report within three months of the expiration of the first six months of the financial year and an annual financial statement (AFS) within six months after the financial year end. Firms that fail to publish their AFS within three months of the financial year end must publish a provisional report, which may be unaudited, but must at least be reviewed. Firms may also choose to publish a preliminary report prior to the AFS or provisional report. Furthermore, all firms, except those that publish quarterly results, are required, since April 2010, to publish a trading statement when they are satisfied that their forthcoming financial results will differ from the previous comparable result (or a profit guidance of the forthcoming result) by more than 20%. Trading statements must quantify the difference in results by either providing a specific percentage difference, a minimum percentage difference or a percentage range.

4.5.2 Content of financial reports

The JSE's listing requirements set out the minimum content that must be included in the interim, preliminary, provisional and annual reports. Firms are required to disclose headline earnings per share (EPS), diluted EPS and basic EPS, which is required by IFRS. Headline EPS measure earnings generated from day-to-day operational activities and as such exclude profits or losses from the sale, reorganization and revaluation of assets¹. Diluted EPS on the other hand measures the total earnings generated by a firm if all sources of dilution, such as convertible preference shares, are exercised while basic EPS measures total earnings based on the number of shares outstanding during the reporting period. Where a firm has not issued any convertible preference shares, the diluted EPS will be equal to basic earnings per share. The JSE also requires that all firms provide a reconciliation of headline EPS with earnings used in calculating EPS.

¹ Although not mandatory in terms of the JSE listing requirements, diluted headline earnings per share are calculated by making the same adjustments as with diluted earnings per share. See SAICA circular 3/2012.

With regard to trading statements, the minimum financial information required is similar to the interim, preliminary, provisional and annual reports. Because trading statements report a material change in a firm's results, the JSE sets out the criteria for price sensitive information to include headline EPS and EPS.

4.5 Conclusion

This chapter has provided historical context and a discussion of the idiosyncratic characteristics of the JSE. The chapter highlighted the role played by the Witwatersrand gold discovery in the establishment and development of the JSE and the deregulation process that occurred during the mid 1990's. The chapter also provided insight into the relative size and liquidity of the JSE and reviewed some important findings on market segmentation on the exchange. This discussion on segmentation highlighted the important role played by the Financial-Industrial and Resources sectors in modelling returns variation on the exchange. Furthermore, the discussion on the JSE's disclosure requirements provided insight on the information required in financial reports, the publication of which constitutes the events studied in this research.

Chapter 5: Research hypotheses and methodology

5.1 Introduction

The previous two chapters have discussed prior research findings and provided some insight into the JSE's idiosyncratic characteristics. This chapter discusses the proposed hypotheses to be tested in this research as well as the methodology used in testing the proposed hypotheses. The next section proposes five testable hypotheses and discusses their underlying logic with reference to previous research on the relationship between earnings and share returns.

5.2 Research hypotheses

5.2.1 The association between trading statements and share returns

The early studies on the information content of earnings found earnings announcement to be associated with abnormal returns in the period surrounding their publication. This association between earnings announcements and security prices stems from the role of information in capital markets theory. Modern capital markets theories view information and individuals' beliefs as crucial inputs in the setting of equilibrium prices, in the allocation of resources within markets and in the inter-temporal consumption decisions made by individuals (Baruch Lev and Ohlson, 1982). New information should therefore lead to a reassessment of individuals' beliefs and expectations of the likelihood of alternative outcomes, which should be reflected in changes to equilibrium prices. In an alternative definition Beaver (1968) points to the change in expectation as a necessary, but not a sufficient condition for the containment of new information. He argues that the new information should also be sufficiently material to induce changes to optimal portfolio holdings by individual investors (Beaver, 1968). Under these definitions, trading statements contain new and material information if their publication leads to a reassessment of beliefs and expectations with such changes reflected in security prices. This leads to the first two hypotheses to be examined in this research:

- **Hypothesis one:** Trading statements contain new information as reflected in investor reactions around the period of their release.
- **Hypothesis two:** Unexpected earnings in trading statements are positively associated with abnormal returns.

A caution on the interpretation of the hypothesised association between trading statements and security returns is in order. It is important to note that the above hypothesis is agnostic on the causal link between trading statements and share returns. This is informed by findings in prior research which suggest that investors use more timely sources of information and that accounting information merely forms part of the information subset on which investment decisions are based. The second hypothesis is concerned with the relationship between the sign of unexpected earnings and security returns. Prior research has reported a positive correlation between the sign of unexpected earnings and share returns (eg Ball and Brown, 1968; and Beaver, 1968) with good (bad) news firms exhibiting high (low) share returns. The objective of the second hypothesis is to establish whether this relationship can be extended to trading statement information.

5.2.2 The magnitude of unexpected earnings and abnormal share returns

As discussed in chapter 3, several studies have examined the relationship between the magnitude of the unexpected earnings and share returns. Despite the lack of a theoretical basis for the observed relationship between the magnitude of unexpected earnings or forecast error and share returns, Beaver et al. (1979) provide an interpretation that links the magnitude of the forecast error to the distribution of share returns. According to their interpretation, the forecast error can be viewed as a signal from an information system (Beaver et al., 1979), which may lead investors to reassess their expectations and beliefs and may ultimately be reflected in security prices. This leads to the third hypothesis tested in this research:

- **Hypothesis three:** The magnitude of trading statement forecast errors is positively associated with the magnitude of share returns.

5.2.3 The post-trading statement announcement drift

The predictable drift in share prices in the period following earnings announcements is a well documented phenomenon and has been cited as proof that certain markets are not efficient. This follows from the efficient markets assumption that the effects of new information will on average be instantaneously reflected in prices (Fama, 1965). Thus, if the markets efficiency holds on the JSE, the initial response to trading statements should not be useful in predicting share price movements in the period subsequent to the announcement and preceding the earnings announcement as trading statements information will be incorporated into prices within a few days of the announcement. This leads to the fourth hypothesis to be tested in this research:

- **Hypothesis four:** Abnormal returns are not earned in the period subsequent to trading statements and preceding earnings announcements.

5.2.4 The information content of actual earnings announcements

As mentioned above, prior research has found an association between actual earnings announcements and share returns. More importantly, previous studies have also found that investors use more timely sources of information in their investment decisions (eg Ball and Brown, 1968). Das et al. (2007) suggest that if the price reaction in the period subsequent to trading statements anticipates information contained in the forthcoming earnings announcement, the price reaction to the earnings announcement should be negatively associated with the magnitude of the post trading statement announcement drift. This implies that if trading statements convey a large amount of the information contained in earnings, much of this information will be incorporated into prices in the post trading statement announcement drift and result in a smaller reaction when earnings are announced. This leads to the fifth hypothesis tested in this research:

- **Hypothesis five:** The market reaction at the time earnings are announced is negatively associated with magnitude of the post trading statement announcement.

5.3 Methodology

This study empirically examines the price formation process from trading statement releases to the time actual earnings are announced. The focus is on the share price reaction around four particular periods: (i) the trading statement release date, (ii) the period subsequent to the trading statement release and preceding the actual earnings announcement (iii) the time of the actual earnings announcement and (iv) the 60 day period subsequent to actual earnings announcements. This section provides an in-depth discussion of the methods used in studying the aforementioned price formation process.

5.3.1 The event study

The event study conducted in this research is focused on the returns behaviour of a sample of firms releasing trading statements followed by actual earnings announcements. The events of interest, trading statement releases and earnings announcements, occur at different calendar times and the event window will include the days surrounding the event (Mackinlay, 1997). The events' impact on share returns is captured through an analysis of ex-post abnormal returns, which requires a model of expected returns.

5.3.2 Model of unexpected earnings and portfolio classification

This study uses the simple expectations model and returns-based models of unexpected earnings to classify trading statements into good and bad news portfolios. The simple expectations model classifies firms whose trading statements report an EPS figure that is at least 20% greater than the previously comparable result as good news while those with trading statements reporting an EPS figure that is at least 20% below the previously comparable result as bad news. The returns based unexpected earnings models on the other hand use security prices movements in the period surrounding trading statement releases to classify trading statements. Firms that experience share price increases (decreases) around trading statement releases and earnings announcements are classified as good (bad) news.

In particular, this study adopts the short-run returns-based unexpected earnings models used by Foster et al. (1984) to measure the market's reaction to trading statement releases and earnings announcements. The unexpected earnings models employed in this study are calculated as follows (Foster et al., 1984):

$$FE_i^{SR} = \frac{\sum_{t=-1}^0 \tilde{u}_{i,t}}{\sigma(\tilde{u}_{i,t})}$$

Where FE_i is the forecast error, $\sum \tilde{u}_{i,t}$ are the cumulative abnormal returns over the short-run event windows $[-1, 0]$, $[0, 1]$ and $[-1, 1]$ where the $[p, q]$ notation refers to the period from day p falling before the event date (or on the event date in the case of zero) to day q falling after the event date (or on the event date in the case of zero) and $\sigma(\tilde{u}_{i,t})$ is the standard deviation of the cumulated abnormal return over the 100 trading day periods preceding the $[-1, 0]$, $[0, 1]$ and $[-1, 1]$ event windows.

The use of the returns based unexpected earnings models in addition to the more widely used simple expectations model is motivated by two main considerations. Firstly, the use of returns based unexpected earnings models circumvents the need to supply a framework for investor beliefs since they classify disclosures as good or bad news based on the perceptions of actual market participants (Beaver, Lambert, and Morse, 1980). The idea that security prices can be used to infer investor perceptions stems from rational expectations theory, which holds that investors learn from prior mistakes and utilize all available information in forming expectations such that outcomes do not differ systematically from investor expectations (Taylor, 1983). To this end, investors are expected to not persistently make errors in forming their perceptions on whether a release constitutes good or bad news. Secondly, Foster et al. (1984) note that returns-based models better approximate the independence-over-time assumption of unexpected earnings changes.

5.3.3 Abnormal returns

Once the firms are classified into the appropriate good and bad news portfolios, abnormal share returns are estimated for each of the sample firms as described by the formula:

$$AR_{it} = R_{it} - (E(R_{it})|R_{mt})$$

Where R_{it} is the return on firm i in time period t and $(E(R_{it})|R_{mt})$ is the return on firm i that would be expected in the absence of a trading statement release during the same time period. Specifically, returns are adjusted for individual firms' systematic risk (b_{Fi} and b_{Ri}) using Van Rensburg's (2002) two factor specification. Similar to Afego (2013), the expected returns are estimated over the 100 trading day period preceding the trading statement releases. The model is as follows:

$$R_{it} = \alpha_i + b_{Fi}R_{FINDI} + b_{Ri}R_{RESI} + \varepsilon_t$$

$$\therefore AR_{it} = R_{it} - \alpha_i - b_{Fi}R_{FINDIt} - b_{Ri}R_{RESIt}$$

Where R_{it} is the return on firm i during time period t and R_{FINDit} and R_{RESit} are the returns on the Financial-Industrial and Resources indices during the same time period. The use of van Rensburg's (2002) two factor specification for the firms belonging to these categories is motivated by his finding (discussed in section 4.4) that Financial-Industrial and Resources Indices best capture the returns generating process on the JSE. As mentioned by van Rensburg (2002, pp.88), it is expected that most firms will generally be influenced by one of the factors, but seldom both.

5.3.3.1 Cross-sectional aggregation

To test whether trading statements and actual earnings have information content, tests are conducted to ascertain whether average cross-sectional abnormal returns are significantly different from zero during the period of their release. The average cross-sectional abnormal returns are aggregated across the N announcements according to the formula (Kothari and Warner, 2007):

$$\overline{AR}_{it} = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

Furthermore, under the null hypothesis $H_0: AR = 0$, the statistical significance of the average cross-sectional abnormal returns (ARs) is tested using the following t-statistic:

$$t_{AR} = \frac{\overline{AR}_t}{\sigma(AR_t)/\sqrt{n}}$$

5.3.3.2 Time-series aggregation

Prior research on the effects of accounting information on share returns employs two main time-series aggregation methods, the cumulative abnormal return (CAR) and the buy and hold abnormal return (BHAR). The CARs are cumulated according to the formula:

$$CAR_{it} = \sum_{i=1}^N \overline{AR}_{it}$$

Where \overline{AR}_{it} is the average abnormal return for firm i at time t , n is the number of sample firms in the portfolio and T is the length of the time period over which the abnormal returns are being aggregated. This study uses the CARs metric to cumulate abnormal returns. The CARs are tested for statistical significance, under the null hypothesis $H_0: AR = 0$, using the following t-statistic:

$$t_{CAR} = \frac{CAR_t}{\left[\sum_{s=s_1}^{s_2} \sigma^2(AR_s) \right]^{1/2}}$$

In their examination of the statistical power and specification of event study test statistics, Barber and Lyon (1997) note some shortcomings in the CAR measure. They argue that CARs are a biased estimate of Buy-and-hold Abnormal Returns (BHARs), which can results in incorrect inferences, and that they do not reflect the value of investing in the average sample since they do not account the effects of compounding. The authors therefore favour the BHARs over the CARs. The BHARs are calculated as follows:

$$BHAR_{it} = \frac{1}{N} \sum_{i=1}^N \left(\prod_{t=1}^T (1 + R_{it}) - \prod_{t=1}^T (1 + R_{mt}) \right)$$

Where R_{it} is the return for firm i in period t and R_{mt} is the market return during the same period. However, given that this study focuses on relatively short event windows, the effects of compounding which the BHARs aim to address should be negligible even when the CAR measure is employed (Murie, 2014).

5.4 Conclusion

This chapter has focused on the unresolved issues regarding the effect of trading statements and earnings announcements on share prices on the JSE, which resulted in the proposal of five hypotheses to be empirically tested in this study. The chapter also elaborated on the statistical techniques to be employed in testing the proposed hypotheses. Importantly, these techniques were decided upon by drawing from and modifying techniques used in prior literature.

Chapter 6: Data collection and descriptive statistics

6.1 Introduction

Two main types of data are used in this study: the dates of trading statement and earnings announcements and the share prices of sample firms in the periods surrounding earnings announcements. This section describes this data and provides descriptive statistics that highlight some of the data's salient features.

6.2 Data Sources and sample selection

A sample of 128 trading statement and earnings announcements occurring over the period January 2010 to July 2014 were obtained through a search of the SENS database on McGregor BFA. Out of the 128 trading statements, 97 reported earnings at least 20% above the previous comparable period (good news) while the remaining 31 reported earnings at least 20% below the previous comparable period (bad news). For year-end earnings announcements, the publication date of the earliest of the preliminary report, the annual financial statement or the provisional report is considered to be the announcement date since it is the date on which earnings numbers become public.

Daily closing total return indices, which include dividends, of the 23 sample firms and the Financial-Industrial and Resources Indices were obtained from Datastream. The criterion for firm inclusion into the study were as follows: (i) must be a constituent of the FTSE/JSE Top 40 Index; (ii) must have published a trading statement in the period January 2010 to July 2014 (voluntary trading statements were excluded); and (iii) trading statement and earnings announcement dates must be available on the SENS news service.

Table 1 below presents the summary statistics for the sample firms used in this study. The highest performing firms as measured by mean returns over the sample period were Woolworths (0.135%), Naspers (0.127%) and Aspen Pharmacare (0.121%) while the worst performers, and the only firms with negative mean returns, were the two platinum producers Anglo American Platinum (-0.043%) and Impala Platinum (-0.053%). Similarly, the highest volatility firms as measured by the standard deviation of returns were the resource firms Assore (2.220), Impala Platinum (2.126) and Kumba Iron Ore (2.003).

Interestingly, the “skew” values indicate that most of the returns were fairly symmetric which implies that extreme negative and positive returns were relatively balanced.

Table 1: Summary Statistics (January 2010 – July 2014)

The format of this table is based on Afego (2013: 145). The “Mean” is the average return for each of the sample firms over the sample period January 2010 to July 2014, “StDev” is the return standard deviation, “Min” and “Max” are the minimum and maximum returns respectively, “Skew” measures the skewness of the return distribution of each firm, “ICB Supersector” is the ICB supersector classification for each firm, and “Releases” refers to the number of trading statement releases by each firm included in the sample.

Firm	Mean (%)	StDev	Min (%)	Max (%)	Skew	ICB Supersector	Releases
ARM	0.011	1.932	-7.476	8.438	0.103	Basic Resources	7
Anglo Platinum	-0.043	2.003	-8.014	7.950	0.176	Basic Resources	10
Aspen Pharmacare	0.121	1.579	-6.389	7.748	0.187	Health Care	4
Assore	0.083	2.221	-8.919	18.362	0.505	Basic Resources	8
Barclays Africa	0.024	1.488	-8.666	5.867	-0.140	Banks	2
Discovery	0.098	1.271	-9.530	6.419	-0.373	Insurance	7
Exxaro Resources	0.026	1.856	-7.376	6.292	-0.132	Basic Resources	9
FirstRand	0.074	1.577	-11.156	5.701	-0.382	Banks	5
Impala platinum	-0.054	2.126	-6.551	8.797	0.101	Basic Resources	8
Imperial Holdings	0.070	1.704	-5.598	6.497	0.065	Industrial Goods and Services	4
Kumba Iron Ore	0.017	2.004	-8.829	7.476	-0.183	Basic Resources	8
Massmart	0.042	1.509	-8.300	10.053	0.153	Retail	6
Mediclinic	0.105	1.392	-7.382	6.641	-0.069	Health Care	3
Naspers	0.128	1.888	-6.760	9.832	-0.079	Media	8
Nedbank	0.058	1.466	-6.327	5.859	-0.013	Banks	1
Remgro	0.084	1.342	-4.553	6.232	0.076	Industrial Goods and Services	4
RMB Holdings	0.055	1.966	-36.422	6.837	-5.587	Banks	6
Sasol	0.065	1.440	-4.575	5.406	-0.008	Oil and Gas	5
Standard Bank	0.032	1.395	-6.514	5.016	-0.136	Banks	2
Steinhoff	0.083	1.559	-8.923	5.191	-0.096	Personal and Household Goods	4
Truworths	0.046	1.679	-8.456	6.336	-0.368	Retail	3
Vodacom	0.070	1.436	-8.738	5.402	-0.227	Telecommunications	6
Woolworths	0.135	1.662	-7.884	8.271	-0.219	Retail	8

6.3 Data limitations

As mentioned above, the sample used in this study contains a relatively small sample of 128 observations. The small sample is due to the small number of firms that have released cautionary

announcements since such announcements were made mandatory in 2010. The sample also contains 97 good news and 31 bad news trading statements. The small number of bad news trading statements can be explained by the JSE's bullish trend over the sample period (Murie, 2014), which is reflected in the mean returns shown in Figure 1. The mean returns for the majority of the sample firms over the sample period were positive, with the platinum miners, Anglo American Platinum and Impala Platinum, being the only firms with negative mean returns over the sample period.

6.4 Conclusion

This chapter has focused on explaining the data used in this study, the sources from which the data is obtained and the criterion for firm inclusion into the sample. The chapter also presented summary statistics which provided a context to the performance, volatility and the skewness of the return distribution of sample firms over the sample period. Importantly, the summary statistics showed most firms to have exhibited positive mean returns, reflecting the JSE's bullish trend during the 2010 to 2014 period. Similarly, the small number of bad news trading statements, a potential data limitation, relative to good news statements added further credence to the view that the JSE exhibited a bullish trend over the sample period.

Chapter 7: Results

7.1 Introduction

As mentioned in section 1.2, the aim of this research is to examine share returns on the trading statement release dates, the period following trading statement releases and leading up to the actual earnings announcement, the immediate period surrounding earnings announcements and the 60 day period subsequent to earnings announcements. This chapter discusses the empirical results found in the investigation, starting with the immediate reaction to trading statement releases.

7.2 The immediate reaction to trading statement releases

As has been mentioned earlier, capital markets theory argues that new information leads investors to reassess their beliefs and expectations and that observed share price revisions in the period surrounding trading statement releases are indicative of the release containing new and significant information. The EMH on the other hand holds that the effects of new information will on average be instantaneously be reflected in security prices (Fama, 1965) and highlights the limits of the exploitability of new information. In other words, if the JSE is efficient, abnormal returns should not be earned on the announcement date and in the days following the release as prices adjust immediately to the information contained in trading statements.

To be sure, the first hypothesis test conducted in this study is concerned with whether trading statement releases contain new and significant information. As alluded to above, statistically significant ARs in the period surrounding the releases provides evidence that trading statements contain new information. The hypothesis is as follows:

$$H_0: (AR_0 | \text{trading statements}) = 0$$

$$H_1: (AR_0 | \text{trading statements}) \neq 0$$

Table 2: Average abnormal returns around trading statement release dates

The table provides the abnormal returns (ARs) and their t-statistics for the good and bad news portfolios over the event window. The ARs and their t-statistics are provided for the trading statement classification based on the three unexpected earnings models and for the classification based on the sign of the trading statement. The asterisks represent statistical significance at the 5% level (two-tailed) of significance.

	Model [-1, 0]				Model [-1, 1]				Model [0, 1]				Trading Statement			
	Good News		Bad News		Good News		Bad News		Good News		Bad News		Good News		Bad News	
Obs	68		60		63		65		63		65		97		31	
Day	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat
10	0.162	0.691	0.154	0.588	0.332	1.262	-0.084	-0.345	0.384	1.693	-0.054	-0.215	0.058	0.291	0.893	2.439*
9	0.284	0.998	-0.129	-0.547	0.080	0.274	-0.089	-0.801	0.006	0.018	-0.067	-0.467	0.123	0.760	-0.608	-1.740
8	0.252	1.063	0.091	0.240	0.308	1.245	0.203	0.825	0.181	0.650	0.233	0.928	0.272	1.197	-0.004	-0.011
7	0.137	0.860	-0.077	-0.325	-0.088	-0.575	0.128	0.512	-0.120	-0.867	0.205	0.865	-0.021	-0.110	0.123	0.346
6	0.068	0.368	-0.259	-0.841	0.022	0.133	-0.053	-0.227	0.017	0.094	-0.085	-0.355	-0.193	-1.299	0.307	0.866
5	-0.233	-0.909	-0.187	-0.883	-0.158	-0.775	-0.421	-1.643	-0.260	-1.202	-0.341	-1.297	-0.253	-1.151	-0.527	-1.559
4	0.293	1.488	-0.205	-1.363	0.303	1.429	-0.129	-0.790	0.328	1.722	-0.104	-0.607	-0.020	-0.168	0.612	1.893
3	0.223	1.128	0.122	0.716	0.272	1.354	0.038	0.184	0.221	1.124	0.044	0.225	0.041	0.269	0.295	0.660
2	-0.175	-0.638	-0.154	-0.628	-0.531	-1.628	-0.146	-0.668	-0.382	-1.528	-0.177	-0.876	-0.158	-0.658	-0.638	-2.365*
1	0.130	0.318	0.105	0.434	0.543	1.708	-0.485	-2.297*	0.572	1.720	-0.539	-2.654*	0.035	0.118	0.151	0.964
0	2.111	5.657*	-1.082	-3.338*	1.978	6.179*	-1.146	-3.318*	2.154	6.918*	-1.190	-3.958*	0.824	2.148*	-1.060	-1.838
-1	-0.255	-1.401	-0.432	-1.651	-0.195	-0.958	-0.167	-0.585	-0.493	-2.300*	0.120	0.433	-0.508	-2.832*	0.765	2.259*
-2	-0.174	-0.951	-0.124	-0.351	-0.033	-0.158	-0.153	-0.489	-0.005	-0.024	-0.336	-1.119	-0.091	-0.408	0.191	0.442
-3	0.128	0.547	-0.611	-2.356*	-0.007	-0.030	-0.359	-1.268	0.017	0.077	-0.259	-0.913	-0.194	-0.826	0.207	0.809
-4	-0.006	-0.018	-0.107	-0.363	-0.001	-0.005	-0.057	-0.227	-0.068	-0.276	-0.053	-0.205	-0.175	-1.030	-0.576	-0.985
-5	-0.143	-0.716	-0.289	-0.954	0.088	0.478	-0.480	-1.295	0.050	0.215	-0.517	-1.413	-0.197	-1.134	-0.500	-0.702
-6	-0.087	-0.441	-0.024	-0.142	-0.159	-1.188	0.262	0.930	-0.240	-1.369	0.376	1.397	0.052	0.318	-0.004	-0.008
-7	-0.001	-0.006	-0.217	-0.676	0.103	0.537	-0.398	-0.965	0.059	0.361	-0.601	-1.482	-0.043	-0.202	-0.423	-0.612
-8	-0.217	-1.126	0.182	0.729	-0.182	-0.849	0.160	0.652	-0.266	-1.270	0.266	1.060	-0.203	-1.031	0.503	2.154*
-9	-0.111	-0.607	0.241	1.220	-0.251	-1.115	0.393	1.686	-0.311	-1.300	0.333	1.500	-0.015	-0.082	-0.054	-0.104
-10	0.249	1.053	0.084	0.358	0.098	0.443	0.070	0.360	0.276	0.906	0.074	0.352	-0.056	-0.389	0.736	1.388

Table 2 (above) shows the ARs and their t-statistics for the good and bad news portfolios over the event window. An inspection of the table shows that the ARs based on the $(-1, 0)$, $(-1, 1)$ and $(0, 1)$ unexpected earnings models are significantly positive and negative for the good and bad news portfolios, respectively, on the release date. The ARs for the good and bad news portfolios based on the sign of trading statements are positive and negative respectively, however only the good news portfolio is statistically significant at the 5% level of significance. The null hypothesis of zero ARs on the announcement date can therefore be rejected for all the portfolios, except the bad news portfolio based on the sign of trading statements. The finding of significant ARs on the announcement date suggests that trading statements contain new and significant information to which investors react.

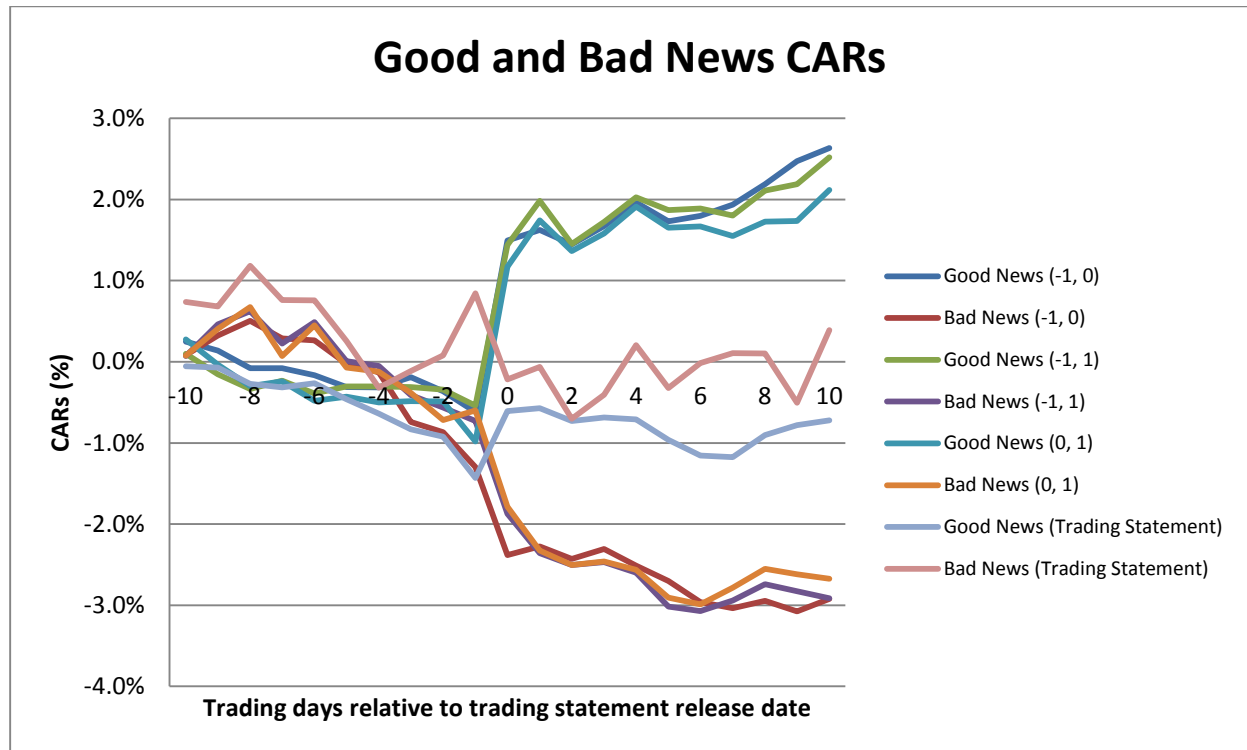
7.3 The post trading statement release period

As mentioned earlier, the efficient markets hypothesis holds that new information is on average instantaneously reflected in security prices (Fama, 1965). If the JSE is efficient then the effect of the initial response to trading statement releases should rapidly be incorporated into security prices and that this initial response to trading statement releases should not be useful in predicting security price movements in the post trading statement release period. This section investigates the existence of post trading statement announcement drift over the period subsequent to their release.

Trading statements are classified into good and bad news portfolios based on the sign of the trading statements and on the $(-1, 0)$, $(-1, 1)$ and $(1, 0)$ unexpected earnings models. Figure 1 (below) shows the CARs for the good and bad news portfolios over the $(-10, 10)$ day period preceding and following trading statement releases. Consistent with Foster et al. (1984: 590), the figure provides preliminary evidence of a positive relationship between the sign of the CARs and trading statement based on the unexpected earnings models. In particular, good (bad) news trading statements based on the unexpected earnings models tend to be associated with positive (negative) CARs. Furthermore, and consistent with Ball and Brown (1968), abnormal share return appear to exhibit predictable drift in the days following the trading statement release.

Figure 1: Good and Bad news CARs in the period surrounding trading statement releases

The table plots the CARs for good and bad news portfolios based on the sign of the trading statement and the (-1, 0), (-1, 1) and (0, 1) unexpected earnings model. The CARs are plotted for the 10 days preceding and following the trading statement releases.



This study also classifies trading statements based on whether earnings are expected to be at least 20% higher (good news) or lower (bad news) than the previously comparable period. In contrast to Murie (2014), good and bad news trading statements based on the trading statement sign show no substantial association with the sign of the CARs as illustrated in figure 1. Consistent with the findings of section 7.2.1 of this study, figure 1 does however provide evidence of market reaction on day 0, with good (bad) news firms exhibiting an increase (decrease) in CARs on this day. This suggests that, although good and bad news portfolios based on the sign of trading statements may not exhibit predictable abnormal return drift in the period following the release, they contain new and significant information as evidenced by abnormal return movements on the day of their release.

7.3.1 Test of association between the sign of trading statements and CARs

Similar to Ball and Brown (1968), a chi-squared test is conducted in order to examine the relationship between the signs of the trading statements and the cumulated abnormal returns in the post trading statement release period. The hypothesis to be tested can be expressed as follows:

H₀: The sign of trading statements and the sign of CARs are independent

H₁: The sign of trading statements are associated with the sign of CARs

Table 3 (below) provides the results for the test of association between the signs of trading statements and CARs over the (2, 15) period subsequent to trading statement releases. Results are reported for event windows from day 2 to day 5, 10 and 15. It is important to note that the sample size becomes progressively smaller as the number of days between the release of trading statements and earnings announcements increases. Since the companies under study wait varying periods (averaging 13 days) between the release of trading statements and earnings, the sample sizes are altered such that the impact of actual earnings announcements is not included in the calculation of the post trading statement release drift.

Table 3: Test of association between the sign of trading statements and CARs

		Model (-1, 0)		Model (-1, 1)		Model (0, 1)		Trading Statement	
Trading Days	Observations	χ^2 stat	p-value	χ^2 stat	p-value	χ^2 stat	p-value	χ^2 stat	p-value
2 to 5	119	0.02	0.90	0.67	0.41	0.67	0.41	0.12	0.73
2 to 10	56	0.29	0.59	0.07	0.79	0.00	1.00	0.11	0.74
2 to 15	35	0.05	0.83	2.16	0.14	1.45	0.23	0.45	0.50

Table 3 provides evidence of no relationship between the signs of the trading statements and CARs over the (2, 15) day post trading statement release period for both the (-1, 0), (-1, 1), (0, 1) models and the unexpected earnings classified according to the sign of the trading statement. This implies that the null hypothesis of no association cannot be rejected at the 95% level of confidence for all four of these models. This suggests that these initial market responses to unexpected earnings and the sign of trading statements cannot be used to predict the sign of abnormal returns over the (2, 15) trading day post-release period and is consistent with semi-strong form market efficiency.

7.3.2 The magnitude of unexpected earnings and abnormal share returns

The relationship between the size of the price responses to unexpected earnings and cumulative abnormal returns is examined using regression analysis, where CARs are regressed on the unexpected earnings measures as follows:

$$y_i = \alpha + bx_i + \varepsilon_i$$

Where y_i is the cumulative abnormal returns over the (-1, 1) day period surrounding trading statement releases, x_i is the unexpected earnings measures (as defined in section 5.3.2) and b is a coefficient that measures the sensitivity of y_i to unitary changes in x_i . This test is premised on the idea that the magnitude of the initial responses to unexpected earnings is a signal which leads investors to reassess their expectations and is ultimately reflected in prices (Beaver *et al.*, 1979). The following hypothesis is tested:

H₀: The magnitude of the unexpected earnings measures and CARs are not related in the post release period

H₁: The magnitude of the unexpected earnings measures and CARs are positively related in the post release period

Table 4: The relationship between size of unexpected earnings measures and the CARs

(2, 5) Post-release period	Model (-1, 0)	Model (-1, 1)	Model (0, 1)
Slope Coefficient	0.000	-0.001	0.000
t-stat	-0.077	-0.419	0.232
p-value	0.939	0.676	0.817
Observation	119	119	119
(2, 10) Post-release period			
Slope Coefficient	0.006	0.002	0.002
t-stat	1.209	0.362	0.381
p-value	0.232	0.719	0.705
Observation	56	56	56
(2, 15) Post-release period			
Slope Coefficient	-0.002	-0.010	-0.009
t-stat	-0.269	-0.931	-1.124
p-value	0.790	0.359	0.269
Observation	35	35	35

Table 4 (above) provides a summary of the regression results for event windows from day 2 to 5, 10 and the entire (2, 15) trading day post release period. The results indicate that none of the slope coefficients are statistically significant, which implies that the null hypothesis of no relationship between the magnitude of unexpected earnings and CARs cannot be rejected. These results are in contrast to Murie (2014) who found a significant association between the magnitude of unexpected earnings and CARs for his (-2, 1) unexpected earnings model, which is not tested in this study.

7.3.3 The post trading statement release drift

Section 7.2 found the good and bad news portfolios to exhibit significantly positive and negative ARs respectively on the trading statement release dates. This is in line with prior findings that earnings announcements are positively correlated with abnormal returns (Ball and Brown, 1968). To probe this further, we test whether abnormal returns are earned in the (1, T) day period subsequent to trading statement releases and whether the sign of the trading statement is positively associated with the CARs over the same period. The hypothesis to be tested is as follows:

$$\mathbf{H_0: CAR_{1 \text{ to } T} = 0}$$

$$\mathbf{H_1: CAR_{1 \text{ to } T} \neq 0}$$

The results reported in table 5 (below) indicate that CARs for all the good and bad news portfolios are not statistically significant over the various holding periods. The null hypothesis that abnormal returns are not earned over the various holding periods can therefore not be rejected at the 95% level of confidence. Though not statistically significant, the highest (lowest) CARs are obtained over the (2, 10) holding period with 0.28% (-0.92%) average CARs for good (bad) new portfolios classified according to the various unexpected earnings models respectively. The highest CARs for portfolios classified according the trading statement sign occur in the (2, 15) day period subsequent to the statement release.

Table 5: Good and bad news CARs over holding periods relative to trading statement release date

Holding Period	Model [-1, 0]				Model [-1, 1]				Model [0, 1]				Trading Statement			
	Good News		Bad News		Good News		Bad News		Good News		Bad News		Good News		Bad News	
	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat
2 to 5	-0.222	-0.120	-0.066	-0.039	-0.423	-0.206	-0.173	-0.103	-0.010	-0.006	-0.569	-0.398	-0.179	-0.143	-0.543	-0.391
2 to 10	0.580	0.172	-0.972	-0.331	0.190	0.053	-0.942	-0.361	0.071	0.021	-0.838	-0.321	-0.345	-0.123	-0.240	-0.071
2 to 15	0.107	0.029	0.887	0.236	-0.856	-0.206	0.851	0.220	-1.286	-0.373	1.432	0.406	0.031	0.009	0.862	0.204

Furthermore and consistent with the Chi-squared test and regression results, table 5 also indicates no statistically significant correlation between the sign of trading statements and the CARs in the post trading statement release period.

The absence of statistically significant abnormal return drift in the period subsequent to trading statement releases is consistent with the notion that market participants wait until the uncertainty with regards to the specific reasons for the significant change in earnings is alleviated via the release of actual earnings announcements. This suggests that the positive relationship between unexpected earnings and abnormal returns in the post-earnings announcement period found by Ball and Brown (1968) and Beaver (1968) cannot be extended to trading statement releases on the JSE.

7.4 The response to actual earnings announcements

This section examines the final stage of the price formation process subsequent to trading statement releases. In particular, the section investigates investors' reaction to actual earnings announcements and whether the price movement in the post-trading statement period affects this reaction.

7.4.1 The information content of actual earnings announcements

As with trading statements, the first test conducted in this section is concerned with whether earnings announcements contain new and significant information. To this end, we test whether the publication of earnings announcements is accompanied by statistically significant abnormal returns. The hypothesis to be tested is as follows:

$$H_0: (AR_0 | \text{earnings announcements}) = 0$$

$$H_1: (AR_0 | \text{earnings announcements}) \neq 0$$

Table 6 (below) provides the abnormal returns for the good and bad news portfolios based on the three unexpected earnings models and the sign of trading statements in the period surrounding the announcements. An inspection of the table indicates that the ARs for the good and bad news portfolios based on the unexpected earnings models are positively related to the sign of the unexpected earnings measures on the earnings announcement date. The ARs for the good (bad) news portfolios based on the $(-1, 0)$, $(-1, 1)$ and $(0, 1)$ unexpected earnings models are positive (negative) and are statistically significant at the 95% level of confidence on this date, implying the rejection of the above stated null hypothesis. In contrast, the ARs for the good and bad news portfolios based on the sign of the trading statement are positive and negative, respectively, but are not statistically significant at the 5% level of significance. The null hypothesis of zero abnormal returns can therefore not be rejected for the portfolios based on the sign of trading statements. Similar to section 7.2, the finding of statistically significant ARs suggests that actual earnings announcements contain new and significant information to which investors react.

Table 6: Average Abnormal Returns around the earnings announcement dates

The table provides the abnormal returns (ARs) and their t-statistics for the good and bad news portfolios over the event window. The ARs and their t-statistics are provided for the trading statement classification based on the three unexpected earnings models and for the classification based on the sign of the trading statement. The asterisks represent statistical significance at the 5% level (two-tailed) of significance.

	Model [-1, 0]				Model [-1, 1]				Model [0, 1]				Trading Statement			
	Good News		Bad News		Good News		Bad News		Good News		Bad News		Good News		Bad News	
Obs	68		60		69		59		62		66		97		31	
Day	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat	AR (%)	t-stat
10	0.304	1.517	-0.073	-0.464	0.249	1.118	-0.099	-0.470	0.275	1.184	-0.035	-0.144	0.254	1.545	-0.338	-1.423
9	0.126	0.588	-0.248	-1.343	0.121	0.603	-0.204	-1.127	0.066	0.304	-0.218	-1.314	-0.003	-0.020	0.065	0.286
8	0.073	0.368	-0.267	-1.639	0.062	0.349	-0.309	-1.890	0.050	0.277	-0.384	-2.278*	-0.135	-0.931	-0.179	-0.580
7	0.069	0.339	0.148	0.934	-0.008	-0.039	0.246	1.414	-0.054	-0.260	0.603	2.457*	0.250	1.648	-0.292	-1.382
6	0.454	2.665*	0.086	0.319	0.519	2.544*	0.202	0.905	0.443	2.156*	0.186	1.040	0.289	1.773	0.003	0.007
5	-0.209	-1.236	0.312	1.376	-0.179	-0.962	0.378	1.560	-0.206	-0.935	0.388	2.003*	0.075	0.423	0.154	0.803
4	0.345	1.487	0.068	0.378	0.321	1.428	0.073	0.397	0.346	1.613	-0.079	-0.529	0.155	1.085	0.246	0.510
3	-0.022	-0.124	0.030	0.185	-0.027	-0.126	-0.196	-1.058	-0.086	-0.399	-0.220	-0.936	-0.001	-0.004	-0.061	-0.203
2	0.142	0.587	-0.002	-0.010	0.453	2.000*	-0.143	-0.784	0.381	1.590	0.161	0.743	0.118	0.744	0.226	1.068
1	0.576	2.103*	0.271	1.247	1.033	5.367*	-0.430	-1.596	1.308	5.817*	-0.575	-3.316*	0.386	1.747	0.380	1.238
0	1.416	7.394*	-1.312	-8.464*	1.251	5.827*	-1.101	-5.836*	1.282	6.425*	-0.905	-5.842*	0.240	1.366	-0.101	-0.248
-1	0.542	2.711*	-0.325	-2.640*	0.472	2.700*	-0.161	-0.896	0.197	0.982	0.406	2.441*	0.212	1.498	0.265	1.167
-2	-0.080	-0.441	-0.085	-0.554	-0.140	-0.854	-0.058	-0.361	-0.060	-0.355	-0.147	-0.943	0.135	1.142	-0.525	-1.637
-3	-0.023	-0.141	-0.013	-0.097	0.056	0.323	-0.206	-1.463	0.173	0.877	-0.412	-2.163*	-0.148	-1.104	0.212	0.650
-4	0.209	1.440	0.088	0.516	0.233	1.442	0.154	1.137	0.297	2.082	0.046	0.323	0.149	1.236	0.274	0.888
-5	-0.189	-1.216	0.006	0.035	-0.238	-1.243	0.008	0.042	-0.293	-1.518	0.164	0.856	0.035	0.296	-0.316	-1.474
-6	-0.257	-1.715	-0.150	-0.675	-0.109	-0.671	-0.170	-0.889	-0.355	-1.958	0.106	0.579	-0.279	-1.907	0.024	0.100
-7	0.159	1.055	0.074	0.613	0.351	2.165*	-0.195	-0.991	0.225	1.398	-0.010	-0.050	0.133	0.887	-0.042	-0.229
-8	0.183	0.979	-0.009	-0.049	0.099	0.476	0.117	0.551	0.113	0.527	0.277	1.198	-0.023	-0.154	-0.027	-0.098
-9	0.095	0.443	0.475	3.366*	0.227	1.090	0.348	2.428*	0.264	1.231	0.119	0.686	0.156	0.868	0.291	1.487
-10	0.153	0.754	0.014	0.066	0.174	0.826	0.003	0.014	0.178	0.823	0.105	0.588	0.168	0.722	-0.347	-1.812

7.4.2 The relationship between post-trading statement drift and CARs in the period surrounding earnings announcements

Having established that actual earnings announcements contain new and significant information, we examine whether the price movement over the post-trading statement release period influences the reaction to actual earnings announcements. To the extent that some of the information contained in earnings announcements is impounded into security prices over the post trading statement period, the reaction to actual earnings is expected to be negatively related to the post-trading statement drift (Das et al., 2007). The hypothesis to be tested is as follows:

H_0 : The market reaction to earnings announcements is not related to the magnitude of the post-trading statement announcement drift.

H_1 : The market reaction at the time earnings are announced is negatively associated with magnitude of the post trading statement announcement.

Table 7 (below) provides the results for the test of association between the magnitude of the post-trading statements drift and CARs over the (-1, 1) period surrounding earnings announcements. As with earlier tests, and for reasons discussed in section 7.3.1, the sample size becomes progressively smaller as the post-trading statement drift period increases.

Table 7: The relationship between the post-trading statement drift and the CARs

(2, 5) Post-release period	Model (-1, 0)	Model (-1, 1)	Model (0, 1)	Trading Statement
Slope Coefficient	0.162	0.144	-0.057	-0.050
t-stat	1.333	1.181	-0.468	-0.410
p-value	0.185	0.240	0.640	0.683
Observation	119	119	119	119
(2, 10) Post-release period				
Slope Coefficient	0.033	-0.020	0.054	0.192
t-stat	0.242	-0.142	0.391	1.417
p-value	0.810	0.887	0.697	0.162
Observation	56	56	56	56
(2, 15) Post-release period				
Slope Coefficient	0.062	0.065	0.031	-0.058
t-stat	0.471	0.492	0.234	-0.441
p-value	0.641	0.626	0.816	0.662
Observation	35	35	35	35

The results indicate the absence of statistically significant relationships between the post-trading statement release drift and the CARs over the $(-1, 1)$ period surrounding actual earnings announcements. The null hypothesis of no relationship between the magnitude of the post-trading statement release drift and the CARs can therefore not be rejected at the 95% level of confidence. These results are consistent with the earlier (section 7.3.3) findings of no statistically significant post-trading statement drift.

The limited amount of information being impounded into security prices over the post-trading statement release period, as made evident by the non-significant drift, implies significant residual information still to be impounded when actual earnings are released. In particular, an inspection of tables 2 and 6 reveals that, for the portfolios classified according to the unexpected earnings models, the ARs are in general more significant (have t-stats with larger absolute values) in the period surrounding earnings announcements than in the period surrounding trading statement releases. These results therefore further substantiate the notion (see section 7.3.3) that investors wait until the uncertainty regarding the specific reason for the change in earnings is alleviated (via the release of earnings announcements) prior to making their investment decisions.

7.4.3 The association between the sign of earnings announcements and CARs

A Chi-squared test is conducted in order to investigate the relationship between the sign of unexpected earnings announcements and the cumulative abnormal returns over the $(2, 60)$ day post earnings announcement period. A significant association would imply the usefulness of the sign of earnings announcements in predicting the direction of CARs over this period and would be at odds with semi-strong form market efficiency. The hypothesis to be tested is as follows:

H₀: The sign of the unexpected earnings and the sign of CARs over the $(2, 60)$ day post earnings announcement period are independent.

H₁: The sign of the unexpected earnings are associated with the sign of CARs over the $(2, 60)$ day post earnings announcement period.

Table 8: The association between the sign of earnings announcements and CARs

Trading Days	Observations	Model (-1, 0)		Model (-1, 1)		Model (0, 1)		Trading Statement	
		χ^2 stat	p-value	χ^2 stat	p-value	χ^2 stat	p-value	χ^2 stat	p-value
2 to 10	128	0.02	0.89	0.54	0.46	0.00	0.95	1.02	0.31
2 to 20	128	0.19	0.66	0.90	0.34	0.34	0.56	2.35	0.13
2 to 30	128	1.25	0.26	0.81	0.37	0.95	0.33	2.36	0.12
2 to 40	128	3.49	0.06	7.51	0.01	7.45	0.01	2.35	0.13
2 to 50	128	2.33	0.13	4.17	0.04	1.65	0.20	6.61	0.01
2 to 60	128	1.13	0.29	2.55	0.11	1.13	0.29	3.45	0.06

The results provided in table 8 provide evidence (in bold) of statistically significant relationships between the sign of unexpected earnings classified according to the (-1, 1) and (0, 1) models and CARs over the (2 to 40) day post earnings announcements period. The table also shows statistically significant associations between these measures for the (-1, 1) model and that classified according to the sign of trading statements over the (2 to 50) day subsequent to earnings announcements. The hypothesis that the sign of unexpected earnings and CARs are independent can therefore be rejected for these models, over these periods. As alluded to above, this implies that the signs of unexpected earnings can usefully be employed to predict the direction of CARs and is at odds with semi-strong form efficiency.

7.4.4 The size of the initial response to unexpected earnings and abnormal share returns

The relationship between the magnitude of unexpected earnings measures and the CARs in the (2, 60) day period subsequent to actual earnings announcements is examined using regression analysis. As mentioned earlier, the test is premised on the idea that the magnitude of unexpected earnings can be viewed as a signal that may lead investors to reassess their beliefs/expectations and may ultimately be reflected in security prices. The hypothesis to be tested is as follows:

H₀: The magnitude of the unexpected earnings measures and CARs are not related in the (2, 60) day post earnings announcements period.

H₁: The magnitude of the unexpected earnings measures and CARs are positively related in the (2, 60) day post earnings announcement period.

Table 9: The relationship between the magnitude of unexpected earnings measures and CARs

(2, 10) Post-release period	Model (-1, 0)	Model (-1, 1)	Model (0, 1)
Slope Coefficient	0.007	0.011	0.007
t-stat	1.707	2.311	2.068
p-value	0.090	0.022	0.041
Observation	128	128	128
(2, 20) Post-release period			
Slope Coefficient	0.008	0.018	0.014
t-stat	1.492	2.768	2.941
p-value	0.138	0.006	0.004
Observation	128	128	128
(2, 30) Post-release period			
Slope Coefficient	0.010	0.023	0.017
t-stat	1.320	2.710	2.777
p-value	0.189	0.008	0.006
Observation	128	128	128
(2, 40) Post-release period			
Slope Coefficient	0.013	0.032	0.024
t-stat	1.491	3.283	3.391
p-value	0.138	0.001	0.001
Observation	128	128	128
(2, 50) Post-release period			
Slope Coefficient	0.016	0.035	0.026
t-stat	1.555	2.950	3.106
p-value	0.122	0.004	0.002
Observation	128	128	128
(2, 60) Post-release period			
Slope Coefficient	0.022	0.044	0.034
t-stat	2.071	3.561	3.893
p-value	0.040	0.001	0.000
Observation	128	128	128

The results presented in table 9 show that the magnitude of unexpected earnings measures is significantly positively related to that of CARs for the unexpected earnings based on the (-1, 0), (-1, 1) and (0, 1) models over the entire 2 to 60 day period subsequent to earnings announcements. The null hypothesis of no relationship between the magnitude of unexpected earnings and CARs can therefore be rejected at the 5% level of significance. These results support the notion that the magnitude of

unexpected earnings is a signal that leads investors to reassess their expectations and are consistent with those of Beaver et al. (1979) and Murie (2014).

In addition to the significant relationship over the entire (2, 60) day period, table 9 also provides evidence of significant relationships between the magnitude of unexpected earnings and CARs for the (-1, 1) and (0, 1) models over the 2 to 10, 20, 30, 40, and 50 sub-periods subsequent to earnings announcements. Interestingly, the size of the slope coefficients increase as the number of days since the publication of earnings increase, which implies that the impact of unexpected earnings on CARs becomes greater with the passage of time. Taken together with the results of the less powerful chi-squared test of association, these results present a stark violation of semi-strong form market efficiency as the effects of this publicly available information (the sign and magnitude of unexpected earnings) fail to be instantaneously reflected in security prices.

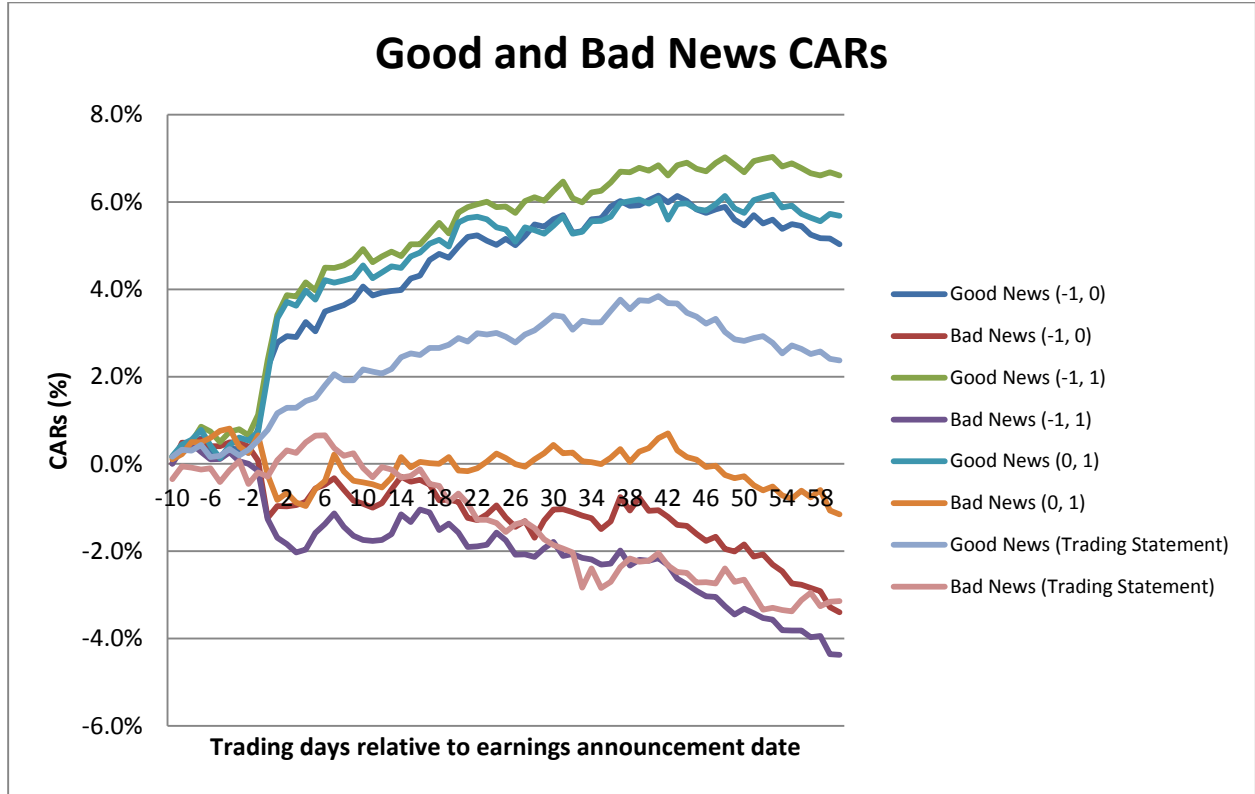
7.4.5 The post earnings announcement drift

This section examines the existence of predictable abnormal returns drift in the (2, 60) day period subsequent to earnings announcements. As mentioned in chapter 3, international researchers investigating asset pricing relationships in developed stock markets have found share returns to exhibit predictable drift in the period subsequent to earnings announcements. This section thus seeks to ascertain whether these findings are applicable on the JSE.

Figure 2 below graphs the CARs for good and bad news portfolios classified according to the sign of trading statements and the (-1, 0), (-1, 1) and (0, 1) models over the (-10, 60) day period preceding and following earnings announcements. As with trading statements, and consistent with Foster et al. (1984) and Murie (2014), the figure provides preliminary evidence of a positive relationship between the sign of unexpected earnings and the CARs. Crucial to the aims of this section, the figure provides compelling visual evidence of predictable abnormal returns drift over the 60 day period subsequent to earnings announcements.

Figure 2: Good and Bad news CARs in the period subsequent to earnings announcements

The figure shows the CARs for good and bad news portfolios based on the sign of the trading statement and the (-1, 0), (-1, 1) and (0, 1) unexpected earnings model. The CARs are plotted for the 10 days preceding the release and the 60 days following the earnings announcement date.



Having established a prima facie association between unexpected earnings and CARs over the (2, 60) day post earnings announcement period, we examine whether this association between unexpected earnings and CARs is in fact statistically significant by testing the following hypothesis:

$$H_0: CAR_{1 \text{ to } T} = 0$$

$$H_1: CAR_{1 \text{ to } T} \neq 0$$

Table 10 below provides the CARs and their t-statistics for the various models over the (2, 60) day period subsequent to earnings announcements. Furthermore, the table also provides CARs and their t-statistics over sub-periods within the (2, 60) day event window. By gradually increasing the number of days

subsequent to earnings announcements, the table illustrates how the magnitude and statistical significance of the CARs evolve with the passage of time over the post earnings announcements period.

Table 10: Good and Bad news CARs over holding period relative to earnings announcement date

Holding Period	Model [-1, 0]				Model [-1, 1]				Model [0, 1]				Trading Statement			
	Good News		Bad News		Good News		Bad News		Good News		Bad News		Good News		Bad News	
	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat
2 to 10	1.281	0.450	0.054	0.021	1.511	0.505	-0.053	-0.021	1.214	0.392	0.401	0.144	1.003	0.454	-0.176	-0.057
2 to 20	2.194	0.549	0.100	0.026	2.346	0.558	0.120	0.030	2.202	0.503	0.677	0.172	1.719	0.529	-0.768	-0.169
2 to 30	2.819	0.601	-0.079	-0.017	2.845	0.569	-0.096	-0.020	2.127	0.412	1.260	0.262	2.236	0.569	-1.947	-0.365
2 to 40	3.259	0.616	-0.106	-0.019	3.305	0.586	-0.524	-0.094	2.630	0.450	1.186	0.217	2.567	0.573	-2.303	-0.369
2 to 50	2.677	0.454	-0.875	-0.139	3.269	0.523	-1.628	-0.259	2.419	0.376	0.544	0.089	1.652	0.330	-2.735	-0.403
2 to 60	2.246	0.349	-2.432	-0.354	0.032	0.467	-2.679	-0.396	2.351	0.332	-0.333	-0.051	0.012	0.224	-3.227	-0.434

The results indicate that there are no statistically significant CARs over the entire (2, 60) day period as well as over the various sub-periods. The null hypothesis of zero cumulative abnormal returns over the post earnings announcements period can therefore not be rejected at the 95% level of confidence. Thus, despite the compelling visual evidence of predictable returns drift over the (2, 60) day period subsequent to earnings announcements, the finding of no statistically significant CARs over this period casts doubt on the ability to use the initial response to earnings to consistently earn above normal returns.

Although broadly consistent with those of Murie (2014), these results differ to those of the aforementioned author in two respects. Firstly, although the two studies report CARs of similar magnitudes, Murie (2014) found the good news CARs for the (0, 1) and (-1, 0) models to be marginally significant at the 95% level of confidence. These differing results may be due to methodological differences, such as the signal days included in calculating the unexpected earnings models and the opposing choices taken with regards to systematic risk adjustment. Secondly, Murie (2014) also found the CARs of the good news portfolio based on the (-2, 1) model to be statistically significant. This model was not explicitly examined in this research.

7.5 Summary of findings

This section summarises the results for the tests conducted in this chapter and their implications about the effects/usefulness of trading statements and earnings announcements on JSE.

The reaction to trading statement releases:

- A significant and positive relationship exists between the sign of good and bad news portfolios based on the $(-1, 0)$, $(-1, 1)$ and $(0, 1)$ unexpected earnings models and abnormal returns on the trading statement release date. Only the good news portfolio is found to have a significant relationship with abnormal returns on the trading statement release date in the case of unexpected earnings based on the sign of trading statements. This indicates that trading statements contain new and significant information to which investors react.
- No significant relationship exists between the sign and magnitude of trading statements in the $(2, 15)$ period subsequent to earnings announcements. This implies that the sign and size of the initial reaction to trading statements cannot be used to predict the direction and magnitude of CARs in the period subsequent to trading statement releases and is consistent with market efficiency.
- No evidence of statistically significant returns drift was found in the $(2, 15)$ day post-trading statement release period. These findings support the notion that investors wait until the uncertainty regarding the specific reasons for the significant change in earnings is confirmed through the release of actual earnings announcements.

The reaction to actual earnings announcements:

- A significant positive relationship exists between the sign of unexpected earnings based on the all three unexpected earnings models and abnormal returns on earnings announcement dates. This suggests that, similar to trading statements, earnings announcements contain new and significant information to which investors react.
- No significant relationships were found between the magnitude of the post-trading statement drift and CARs in the $(-1, 1)$ day period surrounding earnings announcements. The limited amount of information impounded in security prices over the post-trading statement release period, made evident by the insignificant returns drift over this period, implies that the negative relationship between CARs in the period surrounding earnings and the post-trading statement

drift postulated by Das et al. (2007) does not apply on the JSE. These results provide further credence to the notion that investors await the release of actual earnings before making their investment decisions.

- A significant positive relationship exists between the sign and magnitude of unexpected earnings based on the (-1, 0), (-1, 1) and (0, 1) models and CARs over the (2, 60) day period surrounding earnings announcements. Significant positive relationships between the two measures are also found to exist over sub-period from day 2 to day 10, 20, 30, 40, 50 for the (-1, 1) and (0, 1) models in the post earnings announcement period. These findings present a stark violation of semi-strong form market efficiency as the effects of publicly available information fail to be instantaneously reflected in security prices.
- No statistically significant CARs are found in the (2, 60) day post earnings announcement period. This finding casts doubt on the ability to use the initial response to unexpected earnings to consistently earn above-normal returns in the post earnings announcement period and is consistent with semi-strong form market efficiency.

Chapter 8: Conclusions

8.1 Concluding remarks

This study has examined the price formation process from when trading statements are released to the 60 day period subsequent to earnings announcements. In particular, the study focused on the incorporation of new information into security prices on the JSE over four distinct periods: the immediate period surrounding trading statement releases, the period subsequent to trading statement releases and preceding earnings announcements, the period surrounding actual earnings announcements and the (2, 60) day period subsequent to earnings announcements. Although this avenue of enquiry has received significant attention from researchers in developed stock markets, only a handful of studies have focused on emerging markets. Furthermore, and to the best of the author's knowledge, no previous study has examined the entire price formation process from trading statements releases to actual earnings announcements.

The study found the trading statement releases to contain new and significant information as evidenced by the presence of significant abnormal returns on their publication date. In addition, the positive relationship found in developed markets between the sign and size of unexpected earnings and cumulative abnormal returns and the predictable return drift in the period subsequent to earnings announcements, initially identified by Ball and Brown (1968) and Beaver et al. (1969), was found not to be applicable in the case of trading statements on the JSE. Taken together, these findings suggest that investors wait until the uncertainty regarding the specific reason for the change in earnings is alleviated via the release of actual earnings announcements and are consistent with semi-strong form market efficiency.

Consistent with prior literature, actual earnings announcements were found to contain new and significant information to which investors react. In addition, the sign and magnitude of unexpected earnings was found to exhibit a significantly positive relationship with cumulative abnormal returns over the 60 day period subsequent to the announcements, representing a stark violation of semi-strong form market efficiency. Furthermore, the limited amount of information impounded in security prices over the post-trading statement release period, made evident by the insignificant returns drift over this period, implies that the negative relationship between CARs in the period surrounding earnings and the post-trading statement drift postulated by Das et al. (2007) does not apply on the JSE. This provides

further credence to the notion that investors await the release of actual earnings before making their investment decisions.

8.2 Implication for fund managers

The findings of this study present some important practical implications for funds managers. Firstly, the significant positive relationship found between the sign of unexpected earnings and cumulative abnormal returns on the release dates suggest that both releases represent noteworthy market events to which fund managers should pay particular attention. Furthermore, despite the absence of statistically significant and exploitable CARs in the period subsequent to trading statement and earnings announcements, the evidence in this study has highlighted violations of semi-strong form market efficiency and an ability for fund managers to usefully employ the initial reaction to earnings announcements to predict the direction and magnitude of cumulative abnormal returns in the period subsequent to earnings announcements.

8.3 Areas for further research

From the research conducted in this study, the following areas of further research have been identified. Future studies could investigate possible asymmetries in the pre and post-announcement mean returns of the total sample by conducting a pairwise t-test to ascertain whether the CARs of good news are significantly less than or greater than those of bad news.

Furthermore, prior international studies have long documented how trading strategies that mimic the trading behaviour of company insiders, in the form of executives, earn above normal returns. Although South African executives have had to disclose their dealings in shares of companies on whose boards they sit since 2 October 2000, only one published study, Mordant and Muller (2003), has investigated the profitability of directors share dealings on the JSE. Furthermore, international research has provided evidence that company insiders earn abnormal profits from trading on knowledge of forthcoming accounting disclosures (Ke, Huddart, and Petroni, 2003).

Future studies could investigate the profitability of trading strategies that mimic the trading behaviour of JSE company insiders around trading statement releases and earnings announcements, which have been shown to be significant market events in this study. In addition, company specific characteristics which help explain the extent of the profitability of such a strategy could also be sought. Such an enquiry would greatly improve our understanding of the types of information possessed by company executives

and how it is used. These insights would be useful to fund managers who could profit from mimicking the trading behaviour of company executives and to financial regulators who are tasked with investigating instances of suspicious trading by company insiders.

Appendices

Appendix A: Summary of sample trading statements

Date	Company	Ticker	Change	Event
21-Feb-14	African Rainbow Minerals Limited	ARIM	Increase	Trading Statement
19-Feb-13	African Rainbow Minerals Limited	ARIM	Decrease	Trading Statement
16-Feb-12	African Rainbow Minerals Limited	ARIM	Increase	Trading Statement
19-Aug-11	African Rainbow Minerals Limited	ARIM	Increase	Trading Statement
18-Feb-11	African Rainbow Minerals Limited	ARIM	Increase	Trading Statement
23-Aug-10	African Rainbow Minerals Limited	ARIM	Decrease	Trading Statement
11-Feb-10	African Rainbow Minerals Limited	ARIM	Decrease	Trading Statement
14-Jul-14	Anglo American Plat Limited	ANANP	Decrease	Trading Statement
22-Jan-14	Anglo American Plat Limited	ANANP	Increase	Trading Statement
15-Jul-13	Anglo American Plat Limited	ANANP	Increase	Trading Statement
14-Jan-13	Anglo American Plat Limited	ANANP	Decrease	Trading Statement
19-Jul-12	Anglo American Plat Limited	ANANP	Decrease	Trading Statement
19-Jan-12	Anglo American Plat Limited	ANANP	Decrease	Trading Statement
11-Jul-11	Anglo American Plat Limited	ANANP	Increase	Trading Statement
13-Jan-11	Anglo American Plat Limited	ANANP	Increase	Trading Statement
13-Jul-10	Anglo American Plat Limited	ANANP	Increase	Trading Statement
15-Jan-10	Anglo American Plat Limited	ANANP	Decrease	Trading Statement
30-Aug-13	Aspen Pharmacare Holdings Limited	APN	Increase	Trading Statement
21-Feb-13	Aspen Pharmacare Holdings Limited	APN	Increase	Trading Statement
30-Aug-12	Aspen Pharmacare Holdings Limited	APN	Increase	Trading Statement
21-Feb-12	Aspen Pharmacare Holdings Limited	APN	Increase	Trading Statement
3-Feb-14	Assore Limited	ASR	Increase	Trading Statement
4-Feb-13	Assore Limited	ASR	Decrease	Trading Statement
22-Aug-12	Assore Limited	ASR	Increase	Trading Statement
31-Jan-12	Assore Limited	ASR	Increase	Trading Statement
17-Aug-11	Assore Limited	ASR	Increase	Trading Statement
8-Feb-11	Assore Limited	ASR	Increase	Trading Statement
23-Aug-10	Assore Limited	ASR	Decrease	Trading Statement
8-Feb-10	Assore Limited	ASR	Decrease	Trading Statement
3-Feb-14	Barclays Africa Group Limited	BGA	Increase	Trading Statement
1-Feb-12	Barclays Africa Group Limited	BGA	Increase	Trading Statement
12-Feb-14	Discovery Limited	DSY	Increase	Trading Statement
13-Feb-13	Discovery Limited	DSY	Increase	Trading Statement
22-Aug-12	Discovery Limited	DSY	Increase	Trading Statement
15-Feb-12	Discovery Limited	DSY	Increase	Trading Statement
16-Feb-11	Discovery Limited	DSY	Decrease	Trading Statement
25-Aug-10	Discovery Limited	DSY	Increase	Trading Statement

10-Feb-10	Discovery Limited	DSY	Increase	Trading Statement
27-Feb-14	Exxaro Resources Limited	EXX	Increase	Trading Statement
8-Aug-13	Exxaro Resources Limited	EXX	Decrease	Trading Statement
22-Feb-13	Exxaro Resources Limited	EXX	Decrease	Trading Statement
24-Jul-12	Exxaro Resources Limited	EXX	Increase	Trading Statement
3-Feb-12	Exxaro Resources Limited	EXX	Increase	Trading Statement
4-Aug-11	Exxaro Resources Limited	EXX	Increase	Trading Statement
17-Feb-11	Exxaro Resources Limited	EXX	Increase	Trading Statement
5-Aug-10	Exxaro Resources Limited	EXX	Increase	Trading Statement
18-Feb-10	Exxaro Resources Limited	EXX	Decrease	Trading Statement
25-Feb-14	FirstRand Limited	FSR	Increase	Trading Statement
3-Sep-13	FirstRand Limited	FSR	Increase	Trading Statement
25-Feb-13	FirstRand Limited	FSR	Increase	Trading Statement
4-Sep-12	FirstRand Limited	FSR	Increase	Trading Statement
10-Jun-10	FirstRand Limited	FSR	Increase	Trading Statement
16-Aug-13	Impala Platinum Holdings	IMPO	Decrease	Trading Statement
11-Feb-13	Impala Platinum Holdings	IMPO	Decrease	Trading Statement
8-Aug-12	Impala Platinum Holdings	IMPO	Decrease	Trading Statement
3-Feb-12	Impala Platinum Holdings	IMPO	Increase	Trading Statement
12-Aug-11	Impala Platinum Holdings	IMPO	Increase	Trading Statement
27-Jan-11	Impala Platinum Holdings	IMPO	Increase	Trading Statement
12-Aug-10	Impala Platinum Holdings	IMPO	Decrease	Trading Statement
1-Feb-10	Impala Platinum Holdings	IMPO	Decrease	Trading Statement
13-Aug-12	Imperial Holdings Limited	IPL	Increase	Trading Statement
10-Jun-11	Imperial Holdings Limited	IPL	Increase	Trading Statement
2-Feb-11	Imperial Holdings Limited	IPL	Increase	Trading Statement
19-Aug-10	Imperial Holdings Limited	IPL	Increase	Trading Statement
11-Jul-14	Kumba Iron Ore Limited	KIO	Decrease	Trading Statement
17-Jan-14	Kumba Iron Ore Limited	KIO	Increase	Trading Statement
16-Jan-13	Kumba Iron Ore Limited	KIO	Decrease	Trading Statement
6-Jul-12	Kumba Iron Ore Limited	KIO	Decrease	Trading Statement
16-Jan-12	Kumba Iron Ore Limited	KIO	Increase	Trading Statement
7-Jul-11	Kumba Iron Ore Limited	KIO	Increase	Trading Statement
17-Jan-11	Kumba Iron Ore Limited	KIO	Increase	Trading Statement
9-Jul-10	Kumba Iron Ore Limited	KIO	Increase	Trading Statement
19-Feb-14	Massmart Holdings Limited	MSM	Increase	Trading Statement
13-Aug-13	Massmart Holdings Limited	MSM	Increase	Trading Statement
19-Feb-13	Massmart Holdings Limited	MSM	Decrease	Trading Statement
7-Aug-12	Massmart Holdings Limited	MSM	Increase	Trading Statement
25-Jul-11	Massmart Holdings Limited	MSM	Decrease	Trading Statement
13-Jan-10	Massmart Holdings Limited	MSM	Decrease	Trading Statement
6-May-14	Mediclinic International Limited	MDC	Increase	Trading Statement
28-Oct-13	Mediclinic International Limited	MDC	Increase	Trading Statement

17-May-13	Mediclinic International Limited	MDC	Decrease	Trading Statement
15-Nov-13	Naspers Limited	NPN	Increase	Trading Statement
11-Jun-13	Naspers Limited	NPN	Increase	Trading Statement
16-Nov-12	Naspers Limited	NPN	Increase	Trading Statement
18-Jun-12	Naspers Limited	NPN	Increase	Trading Statement
16-Nov-11	Naspers Limited	NPN	Increase	Trading Statement
14-Jun-11	Naspers Limited	NPN	Increase	Trading Statement
18-Nov-10	Naspers Limited	NPN	Increase	Trading Statement
18-Jun-10	Naspers Limited	NPN	Increase	Trading Statement
20-Feb-13	Nedbank Group Limited	NED	Increase	Trading Statement
10-Mar-14	Remgro Limited	REM	Increase	Trading Statement
11-Mar-13	Remgro Limited	REM	Decrease	Trading Statement
10-Nov-10	Remgro Limited	REM	Increase	Trading Statement
9-Jun-10	Remgro Limited	REM	Decrease	Trading Statement
25-Feb-14	RMB Holdings Limited	RMBH	Increase	Trading Statement
3-Sep-13	RMB Holdings Limited	RMBH	Increase	Trading Statement
25-Feb-13	RMB Holdings Limited	RMBH	Increase	Trading Statement
23-Feb-12	RMB Holdings Limited	RMBH	Decrease	Trading Statement
10-Jun-10	RMB Holdings Limited	RMBH	Increase	Trading Statement
8-Mar-10	RMB Holdings Limited	RMBH	Increase	Trading Statement
14-Feb-14	Sasol Limited	SOL	Increase	Trading Statement
1-Aug-13	Sasol Limited	SOL	Increase	Trading Statement
8-Aug-12	Sasol Limited	SOL	Increase	Trading Statement
2-Feb-12	Sasol Limited	SOL	Increase	Trading Statement
29-Jul-11	Sasol Limited	SOL	Increase	Trading Statement
23-Feb-12	Standard Bank Group Limited	SBK	Increase	Trading Statement
18-Feb-10	Standard Bank Group Limited	SBK	Decrease	Trading Statement
11-Feb-14	Steinhoff International Holdings	SHF	Increase	Trading Statement
28-Aug-13	Steinhoff International Holdings	SHF	Increase	Trading Statement
27-Aug-12	Steinhoff International Holdings	SHF	Increase	Trading Statement
22-Feb-12	Steinhoff International Holdings	SHF	Increase	Trading Statement
18-Jan-13	Truworths International Limited	TRU	Increase	Trading Statement
15-Jul-11	Truworths International Limited	TRU	Increase	Trading Statement
14-Jan-11	Truworths International Limited	TRU	Increase	Trading Statement
24-Apr-13	Vodacom Group Limited	VOD	Increase	Trading Statement
22-Oct-12	Vodacom Group Limited	VOD	Increase	Trading Statement
2-May-12	Vodacom Group Limited	VOD	Increase	Trading Statement
28-Apr-11	Vodacom Group Limited	VOD	Increase	Trading Statement
19-Oct-10	Vodacom Group Limited	VOD	Increase	Trading Statement
21-Apr-10	Vodacom Group Limited	VOD	Increase	Trading Statement
18-Jul-13	Woolworths Holdings Limited	WHL	Increase	Trading Statement
16-Jan-13	Woolworths Holdings Limited	WHL	Increase	Trading Statement
17-Jul-12	Woolworths Holdings Limited	WHL	Increase	Trading Statement

17-Jan-12	Woolworths Holdings Limited	WHL	Increase	Trading Statement
19-Jul-11	Woolworths Holdings Limited	WHL	Increase	Trading Statement
20-Jan-11	Woolworths Holdings Limited	WHL	Increase	Trading Statement
21-Jul-10	Woolworths Holdings Limited	WHL	Increase	Trading Statement
20-Jan-10	Woolworths Holdings Limited	WHL	Increase	Trading Statement

Bibliography

- Afego, P. N. (2013). Stock price response to earnings announcements: Evidence from the Nigerian Stock Market. *Journal of African Business*, 14(3), 141–149.
- Arbelaez, H., Urrutia, J., & Abbas, N. (2001). Short-term and long-term linkages among the Colombian capital market indexes. *International Review of Financial Analysis*, 10, 237–273.
- Bachelier, L. (1900). The theory of speculation. *Annale Scientifiques de l'Ecole Normale Superieure*, 3(17), 21–86.
- Ball, R. (1992). The earnings-price anomaly. *Journal of Accounting and Economics*, 15(2-3), 319–345.
- Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159–178.
- Barber, B. M., & Lyon, J. D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, 43, 341–372.
- Beaver, W. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, 6(1), 67–92.
- Beaver, W. (1974). *The information content of the magnitude of unexpected earnings*.
- Beaver, W. H., Clarke, R., & Wright, W. F. (1979). The association between unsystematic security returns and the magnitude of earnings forecast errors. *Journal of Accounting Research*, 17(2), 316–340.
- Beaver, W., Lambert, R., & Morse, D. (1980). The information content of security prices. *Journal of Accounting and Economics*, 2, 3–28.
- Bernoulli, D. (1954). Exposition of a New Theory on the Measurement of Risk. *Econometrica*, 22(1), 23–36.
- Bhana, N. (1995). The share market reaction to earnings announcements - a tests of the efficiency of the Johannesburg Stock Exchange. *Investment Analysts Journal*, 42, 45–57.
- Bhana, N. (1997). Price adjustments on the JSE for announcements of share (stock) dividends. *Investment Analysts Journal*, 46, 35–44.
- Bhana, N. (1998). The share price reaction on the Johannesburg Stock Exchange for (extra) dividend announcements. *Investment Analysts Journal*, 47, 5–15.
- Bhana, N. (2005). The share price reaction to management buyout announcements of companies listed on the JSE Securities Exchange. *Investment Analysts Journal*, 62, 19–30.
- Bhattacharya, U., Daouk, H., Jorgenson, B., & Kehr, C. (2000). When an event is not an event : the curious case of an emerging market & *Journal of Financial Economics*, 55, 69–101.

- Blume, M., & Siegel, J. (1992). The theory of security pricing and market structure. *Journal of Financial Markets, Institutions and Instruments*, 1(3), 3–57.
- Buiter, W. H. (2003). James Tobin: An appreciation of his contribution to economics. *The Economic Journal*, 113(491), F585–F631.
- Coller, M., & Yohn, T. L. (1998). Management Forecasts : What Do We Know ? Maribeth Coller and Teri Lombardi. *Financial Analysts Journal*, 54(1), 58–62.
- Conroy, R. M., Harris, R. S., & Park, Y. S. (1998). Fundamental information and share prices in Japan : evidence from earnings surprises and management predictions. *International Journal of Forecasting*, 14, 227–244.
- Das, S., Kim, K., & Patro, S. (2007). *Management earnings forecasts and subsequent price formation*. Chicago. Retrieved from www.stern.nyu.edu/cons/groups/content/documents/.../uat_025793.pdf
- Dechow, M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics*, 18, 3–42.
- Dolley, J. C. (1933). Characteristics and procedure of common stock split-ups. *Harvard Business Review*, (11), 316–326.
- Elton, E. J., & Gruber, M. J. (1997). Modern portfolio theory , 1950 to date. *Journal of Banking & Finance*, 21, 1743–1759.
- Emanuel, D. (1984). The information content of sign and size of earnings announcements: New Zealand evidence. *Accounting and Finance*, 20, 25–43.
- Fabozzi, F., Gupta, F., & Markowitz, H. (2002). The legacy of modern portfolio theory. *The Journal of Investing*, 11(3), 7–22.
- Fama, E. F. (1965). The behaviour of stock-market prices. *The Journal of Business*, 38(1), 34–105.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383–417.
- Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). The adjustment of stock prices to new information to new information. *International Economic Review*, 10(1), 1–21.
- Firth, M. (1981). The relative information content of the release of financial results data by firms. *Journal of Accounting Research*, 19(2), 521–529.
- Foster, G. (1973). Stock market reaction to estimates of earnings per share by company officials. *Journal of Accounting Research*, 11(1), 25–37.
- Foster, G., Olsen, C., & Shevlin, T. (1984). Earnings releases, anomalies, and the behaviour of security returns. *The Accounting Review*, 59(4), 574–603.

- Fu, H. (2014). Seasonality of earnings momentum in an emerging market: The Taiwan experiences. *International Journal of Financial Research*, 5(1), 71–80. Retrieved from <http://www.sciedu.ca/journal/index.php/ijfr/article/view/3966>
- Graham, B., & Dodd, D. (1934). *Security Analysis: Principles and technique*. Columbus: McGraw-Hill.
- Hodnett, K., & Hsieh, H. (2012). Capital market theories: Market efficiency versus investor prospects. *International Business & Economics Research Journal*, 11(8), 849–862.
- Hong, D., Lee, C., & Swaminathan, B. (2003). *Earnings momentum in international markets*. Retrieved from [http://bschool.nus.edu/departments/FinanceNAccounting/seminars/Papers/dong hong.pdf](http://bschool.nus.edu/departments/FinanceNAccounting/seminars/Papers/dong%20hong.pdf)
- Ke, B., Huddart, S., & Petroni, K. (2003). What insiders know about future earnings and how they use it : Evidence from insider trades. *Journal of Accounting and Economics*, 35, 315–346.
- Kendall, M. (1953). The analysis of economic time-series part I: Prices. *Journal of the Royal Statistical Society. Series A (General)*, 116(1), 11–34.
- Knight, R. (1983). *The association between published accounting data and the behaviour of share prices*. Unpublished PhD, University of Cape Town.
- Kornik, D. (2005). *The relationship between annual earnings and share returns on the JSE securities exchange*. Master's Dissertation, University of Cape Town.
- Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, 31, 105–231.
- Kothari, S. P., & Warner, J. B. (2007). Econometrics of event studies. In B. E. Eckbo (Ed.), *Handbook of corporate finance: Empirical corporate finance volume 1* (pp. 5–36). Amsterdam: North-Holland.
- Latif, M., Arshad, S., Fatima, M., & Farooq, S. (2011). Market efficiency, market anomalies, causes, evidences, and some behavioral aspects of market anomalies. *Research Journal of Finance and Accounting*, 2(9), 1–14.
- Lev, B., & Ohlson, J. A. (1982). Market-based empirical research in accounting : A review, interpretation, and extension. *Journal of Accounting Research*, 20(Supplement), 249–322.
- Lev, B., & Yahalomi, B. (1972). The effect of corporate financial statements on the Israeli Stock Exchange. *Management International Review*, 12(2), 145–150.
- Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, 47(1), 13–37.
- Mackinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, 35(1), 13–39.
- Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77–91.

- Markowitz, H. (1959). *Portfolio selection: Efficient diversification of investment*. New York: John Wiley & Sons.
- Mkhize, H., & Msweli-Mbanga, P. (2006). A critical review of the restructuring of the South African capital market. *International Review of Business Research Papers*, 2(2), 80–91.
- Mordant, N., & Muller, C. (2003). Profitability of directors' share dealings on the JSE. *Investment Analysts Journal*, (57), 17–31.
- Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, 34(4), 768–783.
- Murie, A. (2014). *The informational content of trading statement releases & the analysis of the post trading statement release drift anomaly*. Master's Dissertation, University of Cape Town.
- Nichols, D. R., & Tsay, J. J. (1979). Security price reactions to long-range executive earnings forecasts. *Journal of Accounting Research*, 17(1), 140–155.
- Osborne, M. (1959). Brownian motion in the stock market. *Operations Research*, 7(2), 145–173.
- Patell, J. M. (1976). Corporate forecasts of earnings per share and stock price behavior: Empirical tests. *Journal of Accounting Research*, 14(2), 246–276.
- Rubinstein, M. (2002). Markowitz's "Portfolio Selection": A fifty-year retrospective. *The Journal of Finance*, LVII(3), 1041–1045.
- SAHO. (2014). The Johannesburg Stock Exchange is established. *South African History Online: toward a people's history*. Retrieved from <http://www.sahistory.org.za/dated-event/johannesburg-stock-exchange-established>
- Samuelson, P. (1965). Proof that properly anticipated prices fluctuate randomly. *Industrial Management Review*, 6(2), 41–49.
- Seneque, P. J. (1979). The relationship between portfolio theory and the efficient market hypothesis. *Investment Analysts Journal*, (13), 17–21.
- Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442.
- Swart, D. J., & Hoffman, A. J. (2013). Analysis of the post-earnings announcement drift anomaly on the JSE. *Investment Analysts Journal*, 77(1), 17–34.
- Taylor, J. B. (1983). *Rational expectations models in macroeconomics* (No. 1224). Cambridge Massachusetts. Retrieved from <http://www.nber.org/papers/w1224.pdf>
- Tobin, J. (1958). Liquidity preference as behavior towards risk. *The Review of Economic Studies*, 25(2), 65–86.

- Truong, C. (2012). Information content of earnings announcements in the New Zealand equity market , a longitudinal analysis. *Accounting and Finance*, 52(2012 Suppl.), 403–432.
- Van Rensburg, P. (2002). Market segmentation on the Johannesburg stock exchange II. *Journal for Studies in Economics and Econometrics*, 26(1), 83–100.
- Van Rensburg, P., & Slaney, K. (1997). Market segmentation on the Johannesburg Stock Exchange. *Journal of Studies in Economics and Econometrics*, 21(3), 1–23.
- WFE. (2014). *2013 WFE Market Highlights*. London. Retrieved from http://www.world-exchanges.org/files/2013_WFE_Market_Highlights.pdf
- Williams, J. B. (1938). *The theory of investment value*. Amsterdam: North-Holland.
- Working, H. (1934). A random-differenced series for use in the analysis of time series. *Journal of the American Statistical Association*, 29(185), 11–24.